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 NE Nevada Engineering Kathy Mrotek

BSC

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Page 1 of 2 05 6-28-07

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Section I: Submittal Information (Required)

Subcontractor Converse Consultants	Item Number and Title Hydrogeologic DEIS Analysis Report	Submittal Date April 10, 2006	SRCT # 00030 T06 -00XXX
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Data file information

Filename	Rev	File Size	Description	Application & Version / Add-in or Extension & Version
043110 03 DEIS PBQ&D Caliente Rail Analysis 5 Ft CRC 4-10-06 Rev0	0	2,512kb	Describes the processes used to determine locations for construction of new groundwater wells to provide water resources for Hydrographic Basins along the CRC.	Adobe Acrobat 6.0 Standard / Version 6.0.4 7/25/2005
Appendix A Well Table_Rev1 Alignment	0	43kb	Proposed CRC Well Table, which includes data related to each recommended well site. The table is divided into CRC segments by Hydrographic Basin, for 5-ft alignment.	Adobe Acrobat 6.0 Standard / Version 6.0.4 7/25/2005
Appendix B Well Table_Rev1 Alignment	0	49kb	Well site explanations for each location designated in Appendix A (5-ft Alignment).	Adobe Acrobat 6.0 Standard / Version 6.0.4 7/25/2005
Appendix C Well Table_USGS Alignment	0	41kb	Proposed CRC Well Table, which includes data related to each recommended well site. The table is divided into CRC segments by Hydrographic Basin, for USGS alignment.	Adobe Acrobat 6.0 Standard / Version 6.0.4 7/25/2005
Appendix D Well Table_USGS Alignment	0	51kb	Well site explanations for each location designated in Appendix C (USGS Alignment).	Adobe Acrobat 6.0 Standard / Version 6.0.4 7/25/2005
Appendix E DataDefinitio nsWR_GIS	0	68kb	Data definitions for CRC Water Resources GIS features	Adobe Acrobat 6.0 Standard / Version 6.0.4 7/25/2005

Submittal Description

This Hydrogeologic DEIS Analysis Report, per task 3.1 and 3.2 of the contract, describes the processes used to determine locations for construction of new groundwater wells to provide water resources for Hydrographic Basins along the CRC. Provides information that could be used to support the evaluation of the water resource development strategy described herein as part of the impact analysis of the Environmental Impact Statement (EIS) for the project. Rev.0 submission.

Section II: Metadata

<input type="checkbox"/> GIS Metadata All GIS data is preferred in ArcGIS9.1 UTM, NAD1983, Zone11, Feet.	Projection:
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STR Name		Signature	Date	
KATHRYN A. MROTEK		Kathryn A. Mrotek	4/11/06	



Hydrogeologic DEIS Analysis Report

REV. 0 April 10, 2006

Prepared for:



Prepared by:



Converse Consultants

Caliente Rail Corridor Hydrologic Analyses

Subcontract NN-HC4-00207

10 April 2006

**HYDROGEOLOGIC
DEIS ANALYSIS REPORT**

**CALIENTE RAIL CORRIDOR
YUCCA MOUNTAIN PROJECT, NEVADA**

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Subcontract # (NN-HC4-00207)

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Hydrogeologic DEIS Analysis Report

Caliente Rail Corridor Yucca Mountain Project, Nevada

Subcontract No. NN-HC4-00207

April 10, 2006

Converse Consultants Project No. 04-33110-03

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Hydrogeologic DEIS Analysis

1.0 Introduction

1.1 Background

Construction of the proposed rail line, referred to in this report as the Caliente Rail Corridor (CRC), would require the use of water during construction activities, which is expected to come from groundwater resources. The water used during construction would primarily support construction activities, which include embankment compaction, dust control, and field operations. Potable water would also have to be supplied for workers during rail construction and at various facilities during operation of the rail.

The CRC consists of several corridors that the Department of Energy (DOE) is currently examining in an Environmental Impact Statement for possible construction of a railroad to Yucca Mountain. The current analysis is based on the CRC alignment that was developed from 5-ft topographic contour information, hereafter referred to as the 'Rev.1 Alignment'.

This report references geographical areas and Hydrographic Basins, or Basins, along the CRC according to the following convention:

1. The CRC consists of two parts: (1) common segments where only one alignment is being considered within a right of way (ROW) for construction purposes; and (2) several identified alternative alignments of the CRC that are included for evaluation. For purposes of this report and analysis, all CRC construction ROW are assumed to be 1,000 feet wide, unless otherwise noted.
2. Basins in which any part of the CRC, as defined above passes through are referenced as CRC Basins. There are 19 basins that meet this geographic criterion.

1.2 Purpose and Scope

This report describes the processes used to determine locations for construction of new groundwater wells to provide water resources for 18 of the 19 basins along the CRC. Development of water resources within the Fortymile Canyon (Basin 227A) basin was not analyzed for this report. The overall objective of this report is to provide information that can be used to support the evaluation of the water resource development strategy described herein as part of the impact analysis of the Environmental Impact Statement (EIS) for the project.

The information presented in this document was developed in a GIS environment specifically for the CRC project. The supporting information and data layers related to water resources within this GIS system have previously been described in the *Water Resources Assessment Report, June 27, 2005* (WRA).

2.0 Approach

The approach for specifying locations for, or siting, groundwater wells along the CRC was based on input provided by the project design team, which consists of Bechtel SAIC (BSC) and Nevada Rail Partners (NRP). The information was generally provided in GIS format and included the following:

1. **CRC Alignment-** The alignment used for siting wells was based on GIS data corresponding to *Water Requirements- "Blue Alignment" - October 10, 2005 Map* version, which included common and alternate CRC segments being considered at that time by the CRC design team. This original alignment was based on the latest available data from United States Geological Survey (USGS) 20-foot contour topographic information but has been superseded by an alignment (Rev.1 Alignment) based on 5-foot contour data.
2. **Water Requirements -** The location and volumetric estimates for water requirements were determined by the design team. A

description of the estimated water requirements incorporated in the recommendations for groundwater wells is provided in the Sections that follow.

3. **CRC Facility Features** - These features were generally located by the design team and are described in detail in the Sections that follow.
4. **Existing Information** - Existing hydrogeologic information from the Nevada Division of Water Resources (NDWR), the USGS and numerous public reports was used along with GIS coverage files for various geologic and topographic features. This information was utilized as part of the hydrogeologic analysis to estimate potential depths of wells and anticipated production rates for sited wells along the corridor. Geology coverage is displayed on the Basin Maps attached to this report and described in the Geology Key included with the maps.

2.1 CRC Construction and Facilities Water Requirements

The CRC would include construction activities and facility features that would require water both during construction and during operations following the completion of construction activities. Based on information provided by the design team water requirements considered for the CRC would consist of multiple demands, which generally include:

1. Compaction of material placed in embankments
2. Dust control during excavation, embankment construction and other construction related uses including access roads
3. Temporary construction camps
4. Permanent facilities such as the Nevada Rail Line (NRL) Yard, the NRL Maintenance of Way (MOW) Facility and rail sidings.

All water requirements discussed herein are based on the documents produced for or by the CRC design team, which include the following:

USGS Alignment

- **Route Alignment Definition, Dated 22 July 2005**

Nevada Rail Partners 2005. *Rail Alignment Development Report Caliente Rail Corridor*, Task 6: *Route Alignment Definition*. Document No. T05-00144-O-SYSW-DA-0001-00. Las Vegas, Nevada: Nevada Rail Partners. ACC: ESU.20050719.0007.

- **Facilities Design Analysis Report, dated 27 June 2005**

Nevada Rail Partners 2005. *Facilities-Design Analysis Report Caliente Rail Corridor*, Task 10: Facilities. Document No. T05-00144-R-SYSW-FA-0001-00. Las Vegas, Nevada: Nevada Rail Partners. ACC: ESU.20050719.0005.

Rev.1 Alignment

- **Route Alignment Definition, Dated 15 February 2006**

Nevada Rail Partners 2006a. *Rail Alignment Development Report Caliente Rail Corridor*, Task 6: *Route Alignment Definition*. Document No. NRP-R-SYSW-DA-0001-01A. Las Vegas, Nevada: Nevada Rail Partners. ACC: ENG.20060302.0017.

- **Facilities Design Analysis Report, Dated 15 February 2006**

Nevada Rail Partners 2006b. *Facilities-Design Analysis Report Caliente Rail Corridor*, Task 10: Facilities. Document No. Document No. NRP-R-SYSW-FA-0001-01A. Las Vegas, Nevada: Nevada Rail Partners. ACC: ENG.20060302.0018.

- **Construction Plan, Dated 17 March 2006**

Nevada Rail Partners 2006c. *Construction Plan, Construction Water Requirements (Section 4.4)*, Task 14 Document No. NRP-R-SYSW-CP-0007-01A. Las Vegas, Nevada: Nevada Rail Partners.

Based on information provided by NRP (2006c), water requirements for the CRC project during construction fall into four general categories: water for earthwork compaction, water for construction personnel, water for dust control, and water for ballast quarry operations. The alignments and earthwork quantities described in these documents provided the basis for the

estimated water requirements to support the construction-related activities. The types of fill material, alluvial or rock, were also considered. The rock material was considered to require little or no water for compaction as compared to alluvial, which would require fairly substantial amounts. The demand for construction water would vary over the length of the rail line where areas with the greatest amounts of fill requiring the greatest quantity of water, while areas of cut or rock fill requiring relatively little water for embankment construction.

Water required for dust control and other construction-related uses was determined based on an allowance per mile of line constructed. Water for temporary construction camps was based upon the number of personnel, holding tank capacities and forecasted activity levels. Temporary water would also be required to support start-up at rock quarry sites with an estimated 2-year construction period that would include dust control and washing at each quarry site. These requirements would be temporary and would end when construction activities in that area are completed. Similarly, water requirements for permanent facilities such as the NRL Yard, the NRL MOW Facility, and sidings were also determined. These water requirements would be considered permanent and on-going throughout the operational life of the rail line. A summary of estimated unit water demand requirements for various facilities is provided in Table 2-1.

Table 2-1 – Estimated Facility Water Demand¹

Facility Type	Estimated Annual Demand Per Site		Remarks
	[millions of gallons]	[gpm] ³	
Temporary Water			
Construction Camps	7.7	20	Domestic use based on (350 people per camp) x (80-gal/person/day) at 9 mo/year per site
Quarries	12.5	24	Required to support quarry start-up and 2-year rail line construction (each site)
Permanent Water			
Siding	0.06	<1	Assumed 10,000 gals for fire control and 50,000 gals for maintenance (per year)
Permanent Facilities ²	0.2	<1	Includes total estimated demand for domestic and maintenance/operational use per year for NRL Yard and NRL MOW facilities

Notes:

¹ Table demand estimates based on NRP (2006c)

² Demand for a potential MOW facility near Tonopah, Nevada was not included in this analysis and therefore no new wells were sited to support this facility. Because of the low annual water requirement and the unfavorable geologic setting in which it may be located, it was assumed that existing municipal supply would be relied upon for this MOW.

³ Water demand shown in units of [gpm] is based on the annualized amount and not adjusted for peak (9-month) demand.

All estimated water requirements determined by the design team according to the general criteria described above were then segregated into a “by Water Basin” demand, for each basin and by alignment alternate, as appropriate.

The following scheme was used to convert the proposed water demand at a site to gallons per minute yield needed for each well site:

1. Construction water demand represents the number of gallons required for a twelve-month construction period within each basin. It includes water for soil compaction, dust control and certain miscellaneous uses. Dividing this figure by 525,600 yields the equivalent amount in gallons per minute for 1 year. Since the

actual demand usage would likely be for only nine months the peak requirement in gallons per minute becomes 1.33 times the annualized gallons per minute.

2. For the other, non-embankment construction uses, the gallons per year was converted to gallons per minute by dividing by 525,600.

2.2 Water Demand Classification

Water requirements to support the CRC project were divided into two categories based on duration of use, which included (1) temporary demand, and (2) permanent demand. Within each of these divisions the type of demand was classified as either (1) potable water, or (2) non-potable water. The general types of wells required to meet the specified water demand were grouped according to these same demand categories.

The determination of how specified water demand was identified as temporary or permanent was based on whether that water would be intended to support construction or facilities demand, respectively. Table 2-2 provides a summary of water demand classifications based on whether the water demand was intended for Construction or a CRC facility (listed by types) and varies according to the type of facility. The category Construction - Alt indicates well sites chosen as alternatives where preferred well locations were estimated as having a high likelihood for insufficient groundwater production (based on location).

Table 2-2 – Water Demand Classification

Water Demand Identifications (with all required combinations)	Water Demand Type (by Duration)	Water Demand Type (by Use)
Construction	Temporary	Non-Potable
Construction - Alt ¹	Temporary	Non-Potable
Quarry	Temporary	Non-Potable
Quarry - Alt	Temporary	Non-Potable

Water Demand Identifications (with all required combinations)	Water Demand Type (by Duration)	Water Demand Type (by Use)
Permanent Facility - NRL Yard - NRL MOW	Permanent	Potable ²
Permanent Facility / Siding	Permanent	Potable ²
Siding	Permanent	Non-Potable
Construction / Permanent Facility	Permanent	Potable ²
Construction / Camp	Temporary	Potable ²
Construction / Siding	Permanent	Non-Potable
Camp	Temporary	Potable ²

Notes:

¹ Wells with an 'Alt' designation were included due to siting restrictions (hydrogeologic, land type, proximity to existing permits and/or wells) within the construction ROW of the CRC. These alternate well sites were placed outside of the construction ROW as back-up sites in case demand requirements could not be met for sites within the construction ROW at these locations.

² All wells with a 'potable' use designation were sited at or as close as reasonably possible to the facilities in which the water would be used.

The combination of some classifications in Table 2-2 is because many well sites could serve multiple purposes. For example, wells at a particular site may be used for construction but also meet the needs for a construction camp or long term needs at a siding. The particular application of the water from each well will dictate the specific construction details for the well. More stringent well design criteria must be met to provide potable water than for non-potable uses.

A summary of construction water demand by basin and route segment is provided in Table 2.3. Data for constructing this table is based on information provided by Nevada Rail Partners (2006c).

Table 2-3 –CRC Water Demand by Route and Basin

Basin	Demand Area (Routes, Quarries)	Construction		All Demand ³	
		Route Total ¹ , ac-ft	Peak Route, gpm (for 9- month)	Route Total ² , ac-ft	Peak Route, gpm (for 9- month)
Clover Valley	CAL/CS1a	14	11	16	12
Clover Valley	ECC/CS1a	77	63	80	66
Panaca Valley	CAL/CS1a	415	343	454	375
Panaca Valley	ECC/CS1a	530	437	566	468
Dry Lake Valley	CS1a/CS1b	429	355	468	386
Pahroc Valley	CS1b/WR1	905	747	919	760
White River Valley	CS1b/WR1	52	43	81	67
Coal Valley	CS1-WR1/GV1	74	61	79	65
Coal Valley	CS1-WR1/GV2	126	104	133	110
Coal Valley	CS1-WR1/GV3	75	62	80	66
Coal Valley	CS1-WR1/GV8	106	88	113	93
Garden Valley	GV1	240	198	274	226
Garden Valley	GV2	116	96	149	123
Garden Valley	GV3	168	139	203	168
Garden Valley	GV8	111	92	146	121
Penoyer Valley	CS2a	134	110	145	120
Railroad Valley South	CS2a- CS2b/SR2/CS3	156	129	197	162
Railroad Valley South	CS2a- CS2b/SR3/CS3	128	106	169	139
Hot Creek Valley	CS3	380	314	416	344
Stone Cabin Valley	CS3	153	127	197	163
Ralston Valley	CS3/GF1	83	68	119	99
Ralston Valley	CS3/GF3	531	438	573	473
Ralston Valley	CS3/GF4	93	77	129	107
Alkali Spring Valley	GF1	134	111	141	116
Alkali Spring Valley	GF4	542	447	550	454
Stonewall Flat	GF1	284	235	291	240
Stonewall Flat	GF3	450	372	458	378
Stonewall Flat	GF4	41	33	43	35
Lida Valley	GF4/CS4/BC2	341	282	378	312

Basin	Demand Area (Routes, Quarries)	Construction		All Demand ³	
		Route Total ¹ , ac-ft	Peak Route, gpm (for 9- month)	Route Total ² , ac-ft	Peak Route, gpm (for 9- month)
Lida Valley	GF1/CS4/BC2	212	175	245	203
Lida Valley	GF1/CS4/BC3	124	102	156	129
Lida Valley	GF3/CS4/BC2	224	185	257	212
Lida Valley	GF3/CS4/BC3	135	112	168	138
Lida Valley	GF4/CS4/BC3	253	209	289	239
Sarcobatus Flat	BC2/CS5	324	268	366	302
Sarcobatus Flat	BC3/CS5	405	335	449	371
Oasis Valley	CS5/OV1/CS6	374	309	406	336
Oasis Valley	CS5/OV3/CS6	540	446	574	474
Crater Flat	BW1	223	184	259	214
FortyMile Canyon	BW1	556	459	572	464
	Two Quarries			58	48
	Other Distributed Demand³			42	35
TOTAL FOR BASIS OF ANALYSIS⁴ =		5,500 ac-ft		6,109 ac-ft	

Notes:

¹ Route total 'construction demand' is based on 75 gal/cy plus a 20% contingency for earthwork (compaction), based on NRP (2006c).

² Route total 'all demand' is a total of 'construction demand' plus site-specific facility demand estimates within each basin at 20-gpm for construction camps, 24-gpm for a total of 2 quarries, <1-gpm for sidings and permanent facilities (i.e. yards, MOWs) plus 186,000 gal/mile (31% of 600,000 gal/mi other water allocation) demand for dust control.

³ Other Distributed Demand is the difference in total Basis of Analysis demand between 6,109 ac-ft based on Construction Plan (NRP, 2006d) and the amounts shown here. It reflects the need to provide discrete site specific water supplies to meet the demand. In the Construction Plan, water needs were allocated on a per mile (of route) basis, instead of a specific site basis as analyzed in this report. Sufficient excess well capacity has been included for the proposed well sites, presented later in this report, to cover this amount of uncertainty in the required water demand.

⁴ Bolded and italicized basin and route segments represent the 'Basis of Analysis' CRC alignment.

3.0 Siting Approach - New Wells

The approach for determining the appropriate number and location of groundwater wells for the CRC project was based on the information regarding water requirements for construction activities and facilities as well as available hydrogeologic information. It was assumed that no existing appropriated water resources (from wells) would be used and all water would come from newly

constructed wells. As a result, the approach for siting new wells represents a potential upper range, or bounding condition, for development of new water resources. The extent to which DOE may negotiate access to existing water rights is unknown at this time.

As described in *2.0 Approach* above, estimates for required construction and facilities water demand was provided by the design team. In order to provide an estimate of the potential number and location of new groundwater wells a comparison had to be made between the required water demand and the estimated amount of water that may be available at or as close as possible to where the demand would be needed. Determinations of where and how much groundwater might be available were based on a comprehensive review of existing geographic and hydrogeologic information, as documented in the *Water Resources Assessment Report, June 27, 2005*. In addition, high-resolution aerial photography of the CRC was used to help identify site-specific surface features throughout basins along the rail alignment.

3.1 Objectives for Recommending Well Locations

In general the preferred locations for proposed well sites would be within the 1,000-foot construction ROW for the CRC alignment and as close to where the most demand was required as possible. The construction ROW of 1,000 ft applies to all of the alignment segments except near Caliente within the Panaca Valley basin segment from Caliente to the crossing of Highway 93 where the ROW decreases to 100 - 200 feet based on an abandoned UP rail line. Whenever the available information used for determining water availability indicated that groundwater pumping did not appear to be feasible from a particular area within the construction ROW, the proposed well sites were relocated as near as reasonably possible to the ROW. When well sites were moved off the construction ROW, they were placed adjacent to documented land disturbances that represented roadway features (improved and unimproved). Proposed well sites were not located within Nevada Test Site and Nevada Test & Training Range land. In addition, well sites were not located on documented private land unless the associated segment of the CRC alignment passes through private land. This situation occurred in only one basin, Panaca Valley, where much of the southern portion of CRC lies within private land.

3.2 Objectives for Determining Required Number of Wells

The required number of wells was generally determined with an objective of minimizing the number of wells needed to supply all construction-related and permanent facility water demands. The number of wells would be dependent upon an estimated yield at a given well site, and a small contingency in the event that a well produced less than expected. The majority of water is needed on a temporary basis to support temporary construction. For many areas along the CRC route there is little or no information regarding subsurface conditions and groundwater availability. These areas could require additional wells to reduce the risk of insufficient groundwater production at reasonable distances from the CRC construction ROW.

3.3 Well Siting Summary

The actual potential number of wells and well sites that may be required depends upon the combination of alternative route segments comprising the final selected CRC route. Included in Appendix A is the Proposed CRC Well Table, which includes data related to each recommended well site, except for wells that would be used in the Fortymile Canyon (Jackass Flats) Basin (227A). The table is divided into CRC segments by Hydrographic Basin. Table 3-1 below includes a description of table headings in the Proposed CRC Well Table shown in Appendix A and B.

As shown in Table 3-2, a maximum total of 190 well sites were identified for all segments included in the CRC. Note that Table 3-2 includes, for planning purposes, a summary of only minimum and maximum well site conditions based on the various route alternatives. Table 3-3 includes 26 well sites that were sited for all potential quarry sites. Tables 3-2 and 3-3 also include potential ranges for number of wells and total well depths for each basin along the CRC.

Table 3-1 – Descriptions of Appendix Well Table Headings

Column Heading	Description
Basin	Title of the defined Hydrographic Basin in which a portion of the CRC alignment passes, except for the Fortymile Canyon Jackass Flats Basin (227A).
Route	Routes IDs are based on proposed design alternatives and are used to define all possible alternatives through each basin. Each Route has a complete set of Well Sites to service the unique needs in which it defines. Water resource requirements are a function of the rail alignment and the basin boundary.
Segment	Each entry in this column corresponds to a segment of the CRC alignment as defined by the October 10, 2005 (USGS) alignment. This field only applies to Appendix C and D data.
Demand Point Location	For well sites that apply to construction demand, this field represents the approximate station along the proposed CRC route where water demand may be the highest. Where the water demand is for something other than construction (i.e. facilities), this field represents the approximate location of that specific demand type.
Required Demand Point Production Rate (gpm)	As explained in 2.1 <i>CRC Construction and Facilities Water Requirements</i> , these values were determined by the design team and were based on the estimated amount of water required at designated location(s) along the CRC. All construction water demand estimates (as a total volume) were converted to an annualized pumping rate and expressed as gallons per minute. This conversion included the assumption that water demand for construction activities would occur continuously over 9 months (due to anticipated climate restrictions). Non-construction (facilities) water demand was assumed to occur continuously over an annualized basis and added to construction demand for wells that would service both construction and non-construction demand; see Table 2-1.
Site ID	A unique identifier (ID) assigned to each well site that is comprised of an acronym representing the basin in which the site is located and basin-specific number.
UTM East (meters)	Grid projection representing the center point of a well site location.
UTM North (meters)	Grid projection representing the center point of a well site location.

Column Heading	Description
Number of Wells per Site	The number of wells per site is either 1 or 2. Each well site is assumed to occupy an area of 1.43 acres, or 250 x 250 feet. When 2 wells are specified, it is assumed that one well would be drilled near a corner of the site and the other (if needed) would be drilled somewhere else on the site (as required) within the designated area.
Well Type	Information in this field is based on whether the demand is for construction or a facility. This field matches the identifications for water demand in Table 2-2.
Potable	Water demand by Use based on the type of water demand required. The options for this field include 'potable' and 'non-potable.' See Table 2-2 for additional information.
Permanent	Water demand by Duration based on the type of water demand required. The options for this field include 'permanent' and 'temporary.' See Table 2-2 for additional information.
Proposed Well Depth (feet-bgs)	Estimated based on available hydrogeologic information in the basin and near the proposed well site when available. The estimate is given as a range of anticipated depths below ground surface (bgs) for completion of wells in order meet the required water demand.
Estimated Available Production Rate per Well (gpm)	These values are estimated based on available hydrogeologic information in the basin and near the proposed well site when available. These estimates are provided in ranges are based primarily on reported production rates from NDWR Well Driller's Logs (WRA report and related GIS data) near the proposed site. A comparison between 'Estimated Available Production Rate' and 'Required Production Rate' is made and used to determine the wells that would be needed at each site in order to meet required total water demand.
Within 1,000-ft ROW	This field includes only a 'yes' or 'no' answer. The 1,000 -ft CRC construction ROW is based on well site placement on one side of the 1,000-ft ROW or the other. If the result is 'no,' then the proposed well site is located somewhere outside of the construction ROW.
Comments	Provides additional details on well siting criteria for each site.

Note that Appendix A does not include information on wells in Basin 227A (Fortymile Canyon – Jackass Flats), the basin that covers the portion of the rail

line on the Nevada Test Site. An analysis of this basin was conducted separately because water use in that area must be coordinated with potential needs for repository construction. The following summarizes information on water demand and well locations in that basin.

The total water demand for basin 227A is 572 acre-feet. This includes 556.2 acre-feet for earthwork and 15.8 acre-feet for other needs. This estimate was calculated using the same methods as was used for the rest of the rail line. The proposed points of diversion for this water are existing Well J-12 and the C-Well complex. Approximately equal amounts would be pumped from each location. It is planned that water required for construction of the rail line within basin 227A would be part of the water DOE would appropriate for construction and operation of the repository (430 acre-feet per year). If it is determined that the amount required for construction of the rail line and repository could temporarily exceed the amount appropriated, the methods and schedule for constructing the rail line or repository could be modified to reduce peak water demands or DOE could seek an additional temporary appropriation for rail construction.

Table 3-2 – Summary of Potential New Wells
(Based on Rev.1 Alignment)

			Wells By Basin Route			Minimum Well Count Path ¹			Maximum Well Count Path ¹		
Basin	NDWR Basin No.	Route	Total Wells for Basin Route	Min Depth (ft)	Max Depth ² (ft)	Well Count	Min Depth (ft)	Max Depth ² (ft)	Well Count	Min Depth (ft)	Max Depth ² (ft)
Clover Valley	204	ECC/CS1a	6	700	700				6	700	1,400
Panaca Valley	203	CAL/CS1a	12	1,375	2,250	12	1,375	2,550			
		ECC/CS1a	13	2,275	3,125				13	2,275	3,425
Dry Lake Valley	181	CS1a/CS1b	10	4,600	7,000	10	4,600	11,250	10	4,600	11,250
Pahroc Valley	208	CS1b/WR1	17	5,200	8,650	17	5,200	13,400	17	5,200	13,400
White River Valley	207	CS1b/WR1	2	450	900	2	450	900	2	450	900
Coal Valley	171	CS1-WR1/GV1	2	800	1,000						
		CS1-WR1/GV2	3	600	1,000						
		CS1-WR1/GV3	2	600	1,000				2	600	1,000
		CS1-WR1/GV8	3	600	1,000	3	600	1,500			
Garden Valley	172	GV1	6	950	1,250						
		GV2	5	1,000	1,300						
		GV3	7	1,200	1,600				7	1,200	2,700
		GV8	4	1,000	1,300	4	1,000	1,600			
Penoyer Valley	170	CS2a	6	1,700	1,800	6	1,700	2,800	6	1,700	2,800
Railroad Valley South	173A	CS2a-CS2b/SR2/CS3	9	2,500	3,300				9	2,500	4,300
		CS2a-CS2b/SR3/CS3	9	2,200	3,050	9	2,200	4,700			
Hot Creek Valley	156	CS3	14	3,500	3,500	14	3,500	7,000	14	3,500	7,000

			Wells By Basin Route			Minimum Well Count Path ¹			Maximum Well Count Path ¹		
Basin	NDWR Basin No.	Route	Total Wells for Basin Route	Min Depth (ft)	Max Depth ² (ft)	Well Count	Min Depth (ft)	Max Depth ² (ft)	Well Count	Min Depth (ft)	Max Depth ² (ft)
Stone Cabin Valley	149	CS3	10	1,700	2,400	10	1,700	4,000	10	1,700	4,000
Ralston Valley	141	CS3/GF1	12	3,000	3,400	12	3,000	5,900			
		CS3/GF3	21	5,100	5,400				21	5,100	9,900
		CS3/GF4	12	3,000	3,400						
Alkali Spring Valley	145	GF1	8	700	1,100	8	700	2,200			
		GF4	18	1,300	2,000						
Stonewall Flat	142	GF1	8	2,400	2,800	8	2,400	5,600			
		GF3	12	3,600	4,200				12	3,600	8,400
		GF4	2	3,000	3,400						
Lida Valley	144	GF4/CS4/BC2	20	3,250	4,500				20	3,250	8,000
		GF3/CS4/BC3	7	1,150	2,900	7	1,150	2,900			
Sarcobatus Flat	146	BC2/CS5	8	750	1,200				8	750	1,200
		BC3/CS5	12	1,400	2,300	12	1,400	4,000			
Oasis Valley	228	CS5/OV1/CS6	21	2,500	5,950	21	2,500	5,950			
		CS5/OV3/CS6	25	2,950	6,700				25	2,950	6,700
Crater Flat	229	BW1	8	5,700	7,500	8	5,700	15,000	8	5,700	15,000
Totals						163	39,175	91,250	190	45,775	101,375

Notes:

¹ Well count path represents the minimum or maximum possible number of wells (including quarry wells) through a particular basin with different alignment alternatives, which correspond to the designated route in the table. The minimum and maximum paths are equal in basins where only the 'Basis of Analysis' route applies (i.e. no route alternatives).

² Maximum estimated well depth includes both wells for sites where 2 wells were proposed.

Table 3-3 – Summary of Potential Quarry Wells¹

Proposed Quarry Wells			
Basin	Well Count	Min Depth (ft)	Max Depth (ft)
Clover Valley	4	500	1,000
Panaca Valley	2	425	700
Railroad Valley South	2	700	900
Hot Creek Valley	6	1,500	3,000
Stone Cabin Valley	2	500	1,000
Ralston Valley	6	1,200	3,000
Alkali Spring Valley	4	300	1,000
Totals	26	5,125	10,600

Notes:

¹ The quarry sites included in this table are based on the sites originally included for analysis. Several sites have been eliminated from consideration.

3.4 Well Sites Presentation / GIS

The information for all new well sites based on the Rev.1 Alignment is included in Appendix A and B. A summary of the proposed well sites is also included in Table 3-4. Information for well sites based on the USGS alignment is included in Appendix C and D. The Appendices correspond to data included in the GIS database. Appendix E includes descriptions of the GIS data transmitted as part of this report. The well sites were added to a pre-existing GIS database as a new feature class. This feature class contains the point representation of proposed well sites for the CRC project. Each point represents the center of a 250-foot by 250-foot well site. Each record contains attributes about the well sites and wells at the site. There may be 1 or 2 wells per site, and they are assumed to be identical wells unless otherwise specified in the comments. Comments for well sites provide general information about hydrogeologic features (such as estimated depth to water) and well-specific information that relate to that site's potential to produce groundwater. Well site explanations are also included in attached Appendices B and D for the Rev.1 and USGS Alignments, respectively.

Table 3-4 – Summary of Potential Well Sites
(Based on Rev.1 Alignment)

Basin	All Unique Sites and Wells ¹			Basis of Analysis - Unique Sites and Wells		Alternatives - Unique Sites and Wells		Quarry Sites and Wells ²	
		No. of Sites	No. of Wells	No. of Sites	No. of Wells	No. of Sites	No. of Wells	No. of Sites	No. of Wells
Clover Valley	Alternative Alignments	1	2			1	2		
	Basis of Analysis	0	0	0	0				
	Quarry	2	4					2	4
Panaca Valley	Alternative Alignments	3	3			3	3		
	Basis of Analysis	9	10	9	10				
	Quarry	2	2					2	2
Dry Lake Valley	Basis of Analysis	6	10	6	10				
Pahroc Valley	Basis of Analysis	11	17	11	17				
White River Valley	Basis of Analysis	2	2	2	2				
Coal Valley	Alternative Alignments	3	4			3	4		
	Basis of Analysis	2	3	2	3				
Garden Valley	Alternative Alignments	8	15			8	15		
	Basis of Analysis	3	4	3	4				
Penoyer Valley	Basis of Analysis	4	6	4	6				
Railroad Valley South	Alternative Alignments	2	3			2	3		
	Basis of Analysis	4	7	4	7				
	Quarry	2	2					2	2
Hot Creek Valley	Basis of Analysis	4	8	4	8				
	Quarry	3	6					3	6
Stone Cabin Valley	Basis of Analysis	5	8	5	8				
	Quarry	1	2					1	2

Basin	All Unique Sites and Wells ¹			Basis of Analysis - Unique Sites and Wells		Alternatives - Unique Sites and Wells		Quarry Sites and Wells ²	
		No. of Sites	No. of Wells	No. of Sites	No. of Wells	No. of Sites	No. of Wells	No. of Sites	No. of Wells
Ralston Valley	Alternative Alignments	2	4			2	4		
	Basis of Analysis	9	15	9	15				
	Quarry	3	6					3	6
Alkali Spring Valley	Alternative Alignments	5	10			5	10		
	Quarry	2	4					2	4
Stonewall Flat	Alternative Alignments	1	2			1	2		
	Basis of Analysis	6	12	6	12				
Lida Valley	Alternative Alignments	7	13			7	13		
	Basis of Analysis	4	7	4	7				
Sarcobatus Flat	Alternative Alignments	1	2			1	2		
	Basis of Analysis	7	12	7	12				
Oasis Valley	Alternative Alignments	6	11			6	11		
	Basis of Analysis	13	21	13	21				
Crater Flat	Basis of Analysis	4	8	4	8				
Fortymile Canyon	Basis of Analysis	0	0						
	Totals	147	245	93	150	39	69	15	26

Notes:

¹ All wells and sites categorized into 'Alternative Alignments' apply only to unique wells and sites that are not already included in the 'Basis of Analysis' route(s) within each basin.

² Quarry sites and wells included in this analysis were placed in a unique category of their own as they are not route specific.



Proposed CRC Well Table (Rev.1 Alignment)

Appendix A

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Clover Valley 204													
Clover Valley													
Clover Valley	ECC/CS1a	20250+00	118	CIV2	2389075.40	13668215.25	2	Construction/Permanent Facility	Yes	Yes	200	<50	Yes
			Well Sites	1		Wells Total	2						
Clover Valley													
Clover Valley		Quarry CA-11	24	CIV5	2421511.09	13665381.74	2	Quarry	No	No	300	20	No
		Quarry CA-12	24	CIV1	2390284.70	13667944.71	2	Quarry	No	No	200	<50	Yes
			Well Sites	2		Wells Total	4						
Panaca Valley 203													
Panaca Valley													
Panaca Valley	CAL/CS1a	1145+00	60	PanV4	2362867.78	13679299.33	1	Construction/Permanent Facility	Yes	Yes	150	>100	Yes
		1390+00	1	PanV5	2375715.57	13701116.41	1	Permanent Facility	Yes	Yes	125 - 150	>250	Yes
		1500+00	20	PanV26	2380711.19	13711472.70	1	Camp	Yes	No	75 - 100	>250	Yes
		1648+00	97	PanV6	2384048.59	13711594.69	1	Construction	Yes	No	100 - 150	100	No
				PanV7	2376619.90	13721688.76	1	Construction	No	No	200	1000	Yes
		1948+00	136	PanV11	2360753.84	13727322.95	1	Construction	No	No	100 - 200	50 - 100	Yes
				PanV12	2356292.83	13720626.68	2	Construction	No	No	100 - 300	50	Yes
		2098+00	72	PanV15	2350666.74	13728904.17	1	Construction	No	No	100 - 300	50	Yes
				PanV16	2346077.90	13735797.32	1	Construction/Siding	No	Yes	500	50	Yes
			Well Sites	9		Wells Total	10						
Panaca Valley													
Panaca Valley	ECC/CS1a	1648+00	90	PanV8	2376619.90	13721688.76	1	Construction	No	No	200	1000	Yes
		1948+00	140	PanV9	2360753.84	13727322.95	1	Construction	No	No	100 - 200	50 - 100	Yes
				PanV10	2356292.83	13720626.68	2	Construction	No	No	100 - 300	50	Yes
		20250+00	117	PanV1	2379486.20	13690817.77	1	Construction	No	No	300	75	No
		20420+00	1	PanV24	2380132.64	13705067.64	1	Permanent Facility	Yes	Yes	150	>250	Yes
		20450+00	90	PanV2	2381212.01	13705161.76	1	Construction	Yes	Yes	225	100	No

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Panaca Valley	ECC/CS1a			PanV3	2384048.59	13711594.69	1	Construction	Yes	No	100 - 150	100	No
		20520+00	20	PanV25	2380711.19	13711472.70	1	Camp	Yes	No	75 - 100	>250	Yes
		2098+00	74	PanV13	2350666.74	13728904.17	1	Construction	No	No	100 - 300	50	Yes
				PanV14	2346077.90	13735797.32	1	Construction/Siding	No	Yes	500	50	Yes
			Well Sites	10		Wells Total	11						
Panaca Valley													
Panaca Valley		Quarry CA-8A	24	PanV20	2359315.33	13673634.76	1	Quarry	No	No	175 - 200	<200	No
		Quarry CA-8B	24	PanV23	2365151.01	13691597.56	1	Quarry	No	No	250 - 500	<100	No
			Well Sites	2		Wells Total	2						
Dry Lake Valley 181													
Dry Lake Valley													
Dry Lake Valley	CS1a/CS1b	2370+00	138	DLV1	2329923.50	13726690.73	2	Construction	No	No	1000 - 1500	50	Yes
				DLV2	2317986.34	13729059.40	2	Construction	No	No	750 - 1250	50	Yes
		2820+00	99	DLV3	2297810.71	13745353.60	2	Construction	No	No	350 - 500	50 - 100	Yes
		3120+00	74	DLV4	2265026.13	13753149.26	2	Construction/Camp	Yes	No	500 - 1000	50 - 100	Yes
		3370+00	75	DLV5	2255532.50	13770140.42	1	Construction	No	No	1250 - 1500	50	No
				DLV6	2248861.02	13774377.51	1	Construction	No	No	750 - 1250	50	Yes
			Well Sites	6		Wells Total	10						
Pahroc Valley 208													
Pahroc Valley													
Pahroc Valley	CS1b/WR1	3598+00	123	PahV1	2234707.19	13776865.59	1	Construction/Siding	No	Yes	500 - 1000	<50	Yes
				PahV2	2233147.65	13778999.75	2	Construction	No	No	500 - 1000	<50	Yes
				PahV3	2227794.41	13783185.31	1	Construction	No	No	800 - 1200	50	No
		3748+00	274	PahV4	2227111.51	13796118.85	2	Construction	No	No	750 - 1000	50	No
				PahV5	2231294.82	13794418.58	2	Construction	No	No	750 - 1250	50	Yes
				PahV6	2229089.25	13801187.17	2	Construction	No	No	500 - 1000	>50	Yes
		3937+76	244	PahV7	2227802.81	13809911.08	2	Construction	No	No	500 - 1000	>50	Yes
				PahV8	2214260.42	13812231.73	1	Construction	No	No	250 - 500	>100	No
				PahV9	2217849.02	13821497.04	2	Construction	No	No	500 - 750	50 - 100	Yes

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
		4139+00	69	PahV10	2209400.71	13834696.01	1	Construction	No	No	500 - 600	>100	Yes
		4439+00	50	PahV11	2193560.55	13847443.44	1	Construction	No	No	400 - 600	>100	Yes
			Well Sites	11		Wells Total	17						
White River Valley 207													
White River Valley													
White River Valley	CS1b/WR1	4725+00	20	WRV2	2165871.49	13870463.99	1	Camp	Yes	No	200 - 400	50	Yes
		4799+00	47	WRV1	2154546.27	13870238.05	1	Construction/Siding	No	Yes	250 - 500	50	Yes
			Well Sites	2		Wells Total	2						
Coal Valley 171													
Coal Valley													
Coal Valley	CS1-WR1/GV1	5149+00	35	CoV3	2133314.20	13851704.19	1	Construction	No	No	300 - 500	50	Yes
		5623+00	30	CoV4	2120816.16	13839693.76	1	Construction	No	No	500	50	Yes
			Well Sites	2		Wells Total	2						
Coal Valley													
Coal Valley	CS1-WR1/GV2	28216+00	72	CoV6	2117209.63	13830078.76	2	Construction	No	No	300 - 500	50	Yes
		5149+00	38	CoV5	2133314.20	13851704.19	1	Construction	No	No	300 - 500	50	Yes
			Well Sites	2		Wells Total	3						
Coal Valley													
Coal Valley	CS1-WR1/GV3	29818+00	26	CoV8	2126376.57	13845204.00	1	Construction	No	No	300 - 500	50	Yes
		5149+00	40	CoV7	2133314.20	13851704.19	1	Construction	No	No	300 - 500	50	Yes
			Well Sites	2		Wells Total	2						
Coal Valley													
Coal Valley	CS1-WR1/GV8	5149+00	32	CoV1	2133314.20	13851704.19	1	Construction	No	No	300 - 500	50	Yes
		56198+00	61	CoV2	2116980.45	13829495.39	2	Construction	No	No	300 - 500	50	Yes
			Well Sites	2		Wells Total	3						

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Garden Valley 172													
Garden Valley													
Garden Valley	GV1	5882+00	42	GV10	2076026.05	13819679.87	2	Construction	No	No	150 - 250	50	Yes
		6232+00	79	GV9	2046479.23	13798708.62	2	Construction/Camp	Yes	No	400 - 500	50	Yes
		6532+00	84	GV11	2044567.16	13797396.12	2	Construction	No	No	400 - 500	50	Yes
			Well Sites	3		Wells Total	6						
Garden Valley													
Garden Valley	GV2	28496+00	64	GV2	2098171.12	13810262.25	2	Construction	No	No	200 - 300	50	Yes
		28996+00	39	GV3	2053587.96	13797365.18	1	Construction	No	No	400 - 500	50	Yes
		29020+00	20	GV1	2047671.30	13796856.65	1	Camp	Yes	No	400 - 500	50	Yes
			Well Sites	3		Wells Total	4						
Garden Valley													
Garden Valley	GV3	30248+00	56	GV13	2092677.54	13845585.24	2	Construction	No	No	200 - 300	50	Yes
		30648+00	43	GV14	2056359.12	13818160.51	2	Construction	No	No	300 - 400	50	Yes
		30850+00	20	GV12	2044562.62	13802850.27	1	Camp	Yes	No	400 - 500	50	Yes
		30948+00	49	GV15	2037723.43	13794920.21	2	Construction	No	No	300 - 400	50	Yes
			Well Sites	4		Wells Total	7						
Garden Valley													
Garden Valley	GV8	56477+00	62	GV5	2103803.20	13811323.07	2	Construction/Siding	No	Yes	200 - 300	50	Yes
		56930+00	20	GV4	2047671.30	13796656.65	1	Camp	Yes	No	400 - 500	50	Yes
		56977+00	38	GV6	2053587.96	13797365.18	1	Construction	No	No	400 - 500	50	Yes
			Well Sites	3		Wells Total	4						
Penoyer Valley 170													
Penoyer Valley													
Penoyer Valley	CS2a	6588+00	39	PeV1	2016383.56	13772410.84	2	Construction	No	No	500	30 - 50	No
		6988+00	44	PeV2	1974623.70	13742244.30	2	Construction	No	No	500	50	No
		7170+00	1	PeV4	1970070.70	13753312.77	1	Siding	No	Yes	200 - 300	10	Yes
		7388+00	36	PeV3	1974202.90	13742153.29	1	Construction	No	No	500	50	No
			Well Sites	4		Wells Total	6						

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Railroad Valley South 173A													
Railroad Valley South													
Railroad Valley South	CS2a-CS2b/SR2/CS3	36048+00	65	RrV2	1883771.85	13715910.65	2	Construction	No	No	400 - 500	50	Yes
		36248+00	42	RrV3	1877968.07	13722869.29	1	Construction	No	No	400 - 500	50	Yes
		7670+00	20	RrV1	1930733.79	13725159.32	2	Camp	Yes	No	300 - 400	10	Yes
		8535+00	1	RrV11	1862925.50	13744611.36	1	Siding	No	Yes	400 - 500	50	Yes
		8748+00	34	RrV4	1852105.05	13761974.09	1	Construction	No	No	300 - 500	50	Yes
			Well Sites	5		Wells Total	7						
Railroad Valley South													
Railroad Valley South	CS2a-CS2b/SR3/CS3	7670+00	20	RrV1	1930733.79	13725159.32	2	Camp	Yes	No	300 - 400	10	Yes
		7972+00	65	RrV5	1899959.14	13715828.24	2	Construction	No	No	500 - 750	50	Yes
		8548+00	38	RrV6	1862925.50	13744611.36	2	Construction/Siding	No	Yes	400 - 500	50	Yes
		8748+00	16	RrV7	1852105.05	13761974.09	1	Construction	No	No	300 - 500	50	Yes
			Well Sites	4		Wells Total	7						
Railroad Valley South													
Railroad Valley South		Quarry NN-9A	24	RrV10	1873181.34	13725028.07	1	Quarry	No	No	400 - 500	50	No
		Quarry NN-9B	24	RrV8	1868995.04	13740110.05	1	Quarry	No	No	300 - 400	50	No
			Well Sites	2		Wells Total	2						
Hot Creek Valley 156													
Hot Creek Valley													
Hot Creek Valley	CS3	9156+00	91	HC2	1833584.49	13800392.65	2	Construction/Camp	No	No	500	50	Yes
		9606+00	88	HC4	1825343.84	13839492.82	2	Construction	No	No	500	50	Yes
		9906+00	165	HC5	1818074.11	13855683.52	2	Construction	No	No	500	50	Yes
				HC7	1818965.77	13853875.94	2	Construction	No	No	500	50	Yes
			Well Sites	4		Wells Total	8						
Hot Creek Valley													
Hot Creek Valley		Quarry NN-8D	24	HC1	1833314.88	13802752.22	2	Quarry	Yes	No	500	50	Yes
		Quarry NN-8C	24	HC3	1830961.73	13816426.01	2	Quarry	No	No	500	20	Yes
		Quarry NN-8B	24	HC6	1823785.46	13846380.97	2	Quarry	No	No	500	20	Yes
			Well Sites	3		Wells Total	6						

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Stone Cabin Valley 149													
Stone Cabin Valley													
Stone Cabin Valley	CS3	9985+00	1	SCV7	1799834.79	13859175.14	1	Siding	No	Yes	300 - 500	10	Yes
		10144+00	55	SCV1	1785004.80	13848003.52	2	Construction	No	No	300 - 500	50	Yes
		11044+00	53	SCV2	1729101.45	13780989.22	2	Construction	No	No	200 - 300	50	Yes
		11544+00	34	SCV3	1694748.33	13761075.36	2	Construction	No	No	200 - 300	50	Yes
		10755+00	20	SCV4	1746032.73	13804350.26	1	Camp	Yes	No	200 - 300	50	Yes
			Well Sites	5		Wells Total	8						
Stone Cabin Valley													
Stone Cabin Valley		Quarry NN-8A	24	SCV6	1790976.33	13852540.27	2	Quarry	No	No	500	20	Yes
			Well Sites	1		Wells Total	2						
Ralston Valley 141													
Ralston Valley													
Ralston Valley	CS3/GF1	11904+00	46	RaV1	1630014.37	13769671.52	2	Construction	Yes	No	500	100	Yes
		12153+00	20	RaV14	1627544.59	13770056.73	1	Camp	Yes	No	500	100	Yes
		12534+00	31	RaV2	1599429.43	13747776.81	2	Construction	No	No	500	50	Yes
		MOW 11740	2	RaV3	1664135.49	13763762.65	1	Permanent Facility/Siding	Yes	Yes	300-400	1	Yes
			Well Sites	4		Wells Total	6						
Ralston Valley													
Ralston Valley	CS3/GF3	11904+00	58	RaV7	1630014.37	13769671.52	2	Construction	Yes	No	500	100	Yes
		12153+00	20	RaV16	1627544.59	13770056.73	1	Camp	Yes	No	500	100	Yes
		52298+00	126	RaV8	1601971.12	13747429.17	2	Construction	No	No	500	50	Yes
				RaV9	1602971.13	13746071.93	2	Construction	No	No	500	50	Yes
		52448+00	173	RaV10	1604116.96	13744488.53	2	Construction	No	No	500	50	Yes
				RaV11	1605325.30	13742675.99	2	Construction	No	No	500	50	Yes
		52730+00	1	RaV13	1609877.24	13701513.59	1	Siding	No	Yes	500	5	Yes
		52746+00	94	RaV12	1605200.29	13740613.45	2	Construction	No	No	500	50	Yes
		MOW 11740	2	RaV13	1664135.49	13763762.65	1	Permanent Facility/Siding	Yes	Yes	300-400	1	Yes
			Well Sites	9		Wells Total	15						

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Ralston Valley													
Ralston Valley	CS3/GF4	11904+00	43	RaV4	1630014.37	13769671.52	2	Construction	Yes	No	500	100	Yes
		12153+00	20	RaV15	1627544.59	13770056.73	1	Camp	Yes	No	500	100	Yes
		42098+00	42	RaV5	1600905.18	13759669.45	2	Construction	No	No	500	50	Yes
		MOW 11740	2	RaV6	1664135.49	13763762.65	1	Permanent Facility/Siding	Yes	Yes	300-400	1	Yes
			Well Sites	4		Wells Total	6						
Ralston Valley													
Ralston Valley		Quarry NS-3A	24	RaV10	1606240.98	13732393.86	2	Quarry	No	No	400 - 500	20	No
		Quarry NS-3A	24	RaV11	1606929.96	13732183.88	2	Quarry - alt	No	No	400 - 500	20	No
		Quarry NS-3B	24	RaV9	1608429.27	13719391.63	2	Quarry	No	No	400 - 500	20	No
			Well Sites	3		Wells Total	6						
Alkali Spring Valley 142													
Alkali Spring Valley													
Alkali Spring Valley	GF1	12802+00	66	ASV1	1579711.90	13741859.26	2	Construction	No	No	200 - 300	50	No
		13052+00	50	ASV2	1579707.41	13741653.48	2	Construction	No	No	200 - 300	50	No
			Well Sites	2		Wells Total	4						
Alkali Spring Valley													
Alkali Spring Valley	GF4	42478+00	53	ASV3	1579711.90	13741859.26	2	Construction	No	No	200 - 300	50	No
		42778+00	187	ASV4	1579707.41	13741653.48	2	Construction	No	No	200 - 300	50	No
				ASV5	1579811.57	13741320.14	2	Construction	No	No	200 - 300	50	No
				ASV8	1579915.74	13740799.29	2	Construction	No	No	200 - 300	50	No
		42978+00	216	ASV9	1579519.91	13742424.33	2	Construction	No	No	200 - 300	50	No
			Well Sites	5		Wells Total	10						
Alkali Spring Valley													
Alkali Spring Valley		Quarry ES-7	24	ASV6	1560427.12	13700545.69	2	Quarry	No	Yes	100 - 200	10 - 30	No
Alkali Spring Valley		Quarry ES-7	24	ASV7	1569206.51	13715359.34	2	Quarry - alt	No	Yes	200 - 300	10 - 30	No
			Well Sites	2		Wells Total	4						

PROPOSED WELL SITES
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Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Stonewall Flat 145													
Stonewall Flat													
Stonewall Flat	GF1	13290+00	191	StF1	1612097.08	13670801.25	2	Construction	No	No	600 - 700	30 - 50	No
				StF2	1612513.75	13670427.23	2	Construction	No	No	600 - 700	30 - 50	No
				StF3	1611585.27	13671103.10	2	Construction	No	No	600 - 700	30 - 50	No
		13590+00	49	StF4	1603948.16	13663843.57	2	Construction	No	No	600 - 700	30 - 50	Yes
			Well Sites	4		Wells Total	8						
Stonewall Flat													
Stonewall Flat	GF3	52796+00	184	StF5	1612097.08	13670801.25	2	Construction	No	No	600 - 700	30 - 50	No
				StF6	1612513.75	13670427.23	2	Construction	No	No	600 - 700	30 - 50	No
				StF7	1611585.27	13671103.10	2	Construction	No	No	600 - 700	30 - 50	No
		52996+00	133	StF8	1603948.16	13663843.57	2	Construction	No	No	600 - 700	30 - 50	Yes
				StF9	1604518.87	13665068.14	2	Construction	No	No	600 - 700	30 - 50	Yes
		53346+00	61	StF10	1603260.10	13662419.26	2	Construction	No	No	600 - 700	30 - 50	Yes
			Well Sites	6		Wells Total	12						
Stonewall Flat													
Stonewall Flat	GF4	43542+00	35	StF11	1604765.29	13654622.22	2	Construction	No	No	400 - 500	20	Yes
			Well Sites	1		Wells Total	2						
Lida Valley 144													
Lida Valley													
Lida Valley	GF1/CS4/BC2	13775+00	20	LV19	1600930.92	13645216.77	1	Camp	Yes	No	400 - 500	20	Yes
		14028+00	58	LV13	1592323.36	13627932.76	2	Construction	No	No	250 - 400	20	Yes
				LV14	1592025.55	13625161.30	2	Construction	No	No	250 - 400	20	Yes
		44098+00	63	LV15	1606768.75	13595392.42	2	Construction	No	No	250 - 400	20	Yes
				LV16	1605171.29	13596702.07	2	Construction	No	No	250 - 400	20	Yes
		44282+00	62	LV17	1612449.02	13594188.08	2	Construction	No	No	250 - 400	20	Yes
				LV18	1613469.85	13594021.41	2	Construction	No	No	250 - 400	20	Yes
			Well Sites	7		Wells Total	13						

PROPOSED WELL SITES
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Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Lida Valley													
Lida Valley	GF1/CS4/BC3	13775+00	20	LV8	1600930.92	13645216.77	1	Camp	Yes	No	400 - 500	20	Yes
		14028+00	64	LV5	1592323.36	13627932.76	2	Construction	No	No	250 - 400	20	Yes
				LV6	1592025.55	13625161.30	2	Construction	No	No	250 - 400	20	Yes
		14448+00	45	LV7	1605733.76	13586597.54	2	Construction	No	No	250 - 400	30	Yes
			Well Sites	4		Wells Total	7						
Lida Valley													
Lida Valley	GF3/CS4/BC2	13775+00	20	LV19	1600930.92	13645216.77	1	Camp	Yes	No	400 - 500	20	Yes
		14028+00	67	LV13	1592323.36	13627932.76	2	Construction	No	No	250 - 400	20	Yes
				LV14	1592025.55	13625161.30	2	Construction	No	No	250 - 400	20	Yes
		44098+00	63	LV15	1606768.75	13595392.42	2	Construction	No	No	250 - 400	20	Yes
				Lv16	1605171.29	13596702.07	2	Construction	No	No	250 - 400	20	Yes
		44282+00	61	LV17	1612449.02	13594188.08	2	Construction	No	No	250 - 400	20	Yes
				LV18	1613469.85	13594021.41	2	Construction	No	No	250 - 400	20	Yes
			Well Sites	7		Wells Total	13						
Lida Valley													
Lida Valley	GF3/CS4/BC3	13775+00	20	LV8	1600930.92	13645216.77	1	Camp	Yes	No	400 - 500	20	Yes
		14028+00	73	LV5	1592323.36	13627932.76	2	Construction	No	No	250 - 400	20	Yes
				LV6	1592025.55	13625161.30	2	Construction	No	No	250 - 400	20	Yes
		14448+00	45	LV7	1605733.76	13586597.54	2	Construction	No	No	250 - 400	30	Yes
			Well Sites	4		Wells Total	7						
Lida Valley													
Lida Valley	GF4/CS4/BC2	13775+00	20	LV19	1600930.92	13645216.77	1	Camp	Yes	No	400 - 500	20	Yes
		14028+00	48	LV13	1592323.36	13627932.76	2	Construction	No	No	250 - 400	20	Yes
				LV14	1592025.55	13625161.30	2	Construction	No	No	250 - 400	20	Yes
		43102+00	49	LV9	1585840.44	13651506.17	2	Construction	No	No	400 - 500	20	No
				LV10	1585788.54	13651220.40	1	Construction	No	No	400 - 500	20	No
		43302+00	69	LV11	1585840.44	13651506.17	2	Construction	No	No	400 - 500	20	No
				LV12	1585767.71	13651991.25	2	Construction	No	No	400 - 500	20	No

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
		44098+00	64	LV15	1606768.75	13595392.42	2	Construction	No	No	250 - 400	20	Yes
				Lv16	1605171.29	13596702.07	2	Construction	No	No	250 - 400	20	Yes
		44282+00	62	LV17	1612449.02	13594188.08	2	Construction	No	No	250 - 400	20	Yes
				LV18	1613469.85	13594021.41	2	Construction	No	No	250 - 400	20	Yes
			Well Sites	11		Wells Total	20						
Lida Valley													
Lida Valley	GF4/CS4/BC3	13775+00	20	LV8	1600930.92	13645216.77	1	Camp	Yes	No	400 - 500	20	Yes
		14028+00	57	LV5	1592323.36	13627932.76	2	Construction	No	No	250 - 400	20	Yes
				LV6	1592025.55	13625161.30	2	Construction	No	No	250 - 400	20	Yes
		14448+00	47	LV7	1605733.76	13586597.54	2	Construction	No	No	250 - 400	30	Yes
		43102+00	48	LV1	1585840.44	13651506.17	2	Construction	No	No	400 - 500	20	No
				LV2	1585788.54	13651220.40	1	Construction	No	No	400 - 500	20	No
		43302+00	67	LV3	1585840.44	13651506.17	2	Construction	No	No	400 - 500	20	No
				LV4	1585767.71	13651991.25	2	Construction	No	No	400 - 500	20	No
			Well Sites	8		Wells Total	14						
Sarcobatus Flat 146													
Sarcobatus Flat													
Sarcobatus Flat	BC2/CS5	15200+00	81	SaF9	1644204.11	13527332.84	2	Construction/Camp	Yes	No	200 - 300	50	Yes
		15550+00	66	SaF10	1663434.41	13498950.45	2	Construction	No	No	200 - 300	50	Yes
		15950+00	78	SaF11	1698684.14	13479982.32	2	Construction/Siding	No	Yes	200 - 300	50	Yes
		44582+00	77	SaF8	1626511.28	13560725.19	2	Construction	No	No	150 - 300	50	Yes
			Well Sites	4		Wells Total	8						

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Sarcobatus Flat													
Sarcobatus Flat	BC3/CS5	14688+00	92	SaF1	1611494.02	13563780.81	2	Construction	No	No	200 - 300	50	Yes
				SaF2	1613660.70	13562697.45	1	Construction	No	No	200 - 300	50	Yes
		14888+00	52	SaF3	1626389.77	13556886.85	2	Construction/Siding	No	Yes	200 - 300	50	Yes
		15100+00	59	SaF4	1636910.35	13542238.55	2	Construction	No	No	200 - 500	50	Yes
		15176+00	20	SaF5	1644204.11	13527332.84	1	Camp	Yes	No	200 - 300	20	Yes
		15550+00	70	SaF6	1663434.41	13498950.45	2	Construction	No	No	200 - 300	50	Yes
		15950+00	78	SaF7	1698684.14	13479982.32	2	Construction/Siding	No	Yes	200 - 300	50	Yes
			Well Sites	7		Wells Total	12						
Oasis Valley 228													
Oasis Valley													
Oasis Valley	CS5/OV1/CS6	16200+00	34	OV1	1712983.19	13461777.05	2	Construction	No	No	150 - 300	20	Yes
				OV2	1713417.21	13461681.55	1	Construction	No	No	150 - 300	20	Yes
		16344+00	109	OV3	1725562.64	13453614.74	2	Construction	No	No	50 - 100	50	Yes
				OV4	1725000.14	13454260.56	1	Construction	No	No	50 - 100	50	Yes
				OV24	1702299.71	13467871.44	2	Construction - alt	No	No	100-150	50	Yes
				OV25	1703195.53	13466933.95	1	Construction - alt	No	No	100-150	50	Yes
		16410+00	20	OV9	1726968.88	13447655.30	2	Camp	Yes	No	50 - 150	20	Yes
		16494+00	40	OV5	1726771.65	13450468.94	2	Construction	No	No	50 - 100	50	Yes
				OV26	1704341.36	13466079.81	1	Construction - alt	No	No	100-150	50	Yes
		16718+00	132	OV6	1717901.40	13417366.99	2	Construction - alt	No	No	100 - 150	50	No
				OV7	1738784.14	13422159.07	2	Construction	No	No	1000 - 2000	50	Yes
				OV22	1739402.24	13416340.59	1	Construction	No	No	500 - 2,000?	50	No
				OV8	1717814.58	13418582.28	2	Construction - alt	No	No	100 - 150	50	No
			Well Sites	13		Wells Total	21						

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (feet)	UTM North (feet)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well (gpm)	Within 1000 ft CRC ROW
Oasis Valley													
Oasis Valley	CS5/OV3/CS6	16200+00	55	OV10	1712983.19	13461777.05	2	Construction	No	No	150 - 300	20	Yes
				OV11	1713417.21	13461681.55	1	Construction	No	No	150 - 300	20	Yes
		16718+00	136	OV14	1717901.40	13417366.99	2	Construction - alt	No	No	100 - 150	50	No
				OV15	1738784.14	13422159.07	2	Construction	No	No	1000 - 2000	50	Yes
				OV23	1739402.24	13416340.59	1	Construction	No	No	500 - 2,000?	50	No
				OV16	1717814.58	13418582.28	2	Construction - alt	No	No	100 - 150	50	No
		46200+00	174	OV12	1723781.91	13461031.94	2	Construction	No	No	150 - 300	20	Yes
				OV18	1723480.07	13460890.86	2	Construction	No	No	150 - 300	20	Yes
				OV19	1723125.74	13460808.83	2	Construction	No	No	150 - 300	20	Yes
				OV20	1726916.74	13462154.68	2	Construction	No	No	100 - 200	20	Yes
				OV21	1727520.90	13462300.53	2	Construction	No	No	100 - 200	20	Yes
		46315+00	20	OV17	1729511.09	13449891.42	1	Camp	Yes	No	50 - 150	20 - 30	Yes
		46450+00	89	OV13	1726771.65	13450468.94	2	Construction	No	No	50 - 100	50	Yes
				OV24	1702299.71	13467871.44	2	Construction - alt	No	No	100-150	50	Yes
			Well Sites	14		Wells Total	25						
Crater Flat 229													
Crater Flat													
Crater Flat	BW1	17054+00	61	CF1	1766639.30	13386596.21	2	Construction/Siding	No	Yes	1500 - 2000	50	Yes
		17404+00	36	CF2	1776441.22	13366744.48	2	Construction	No	No	1500 - 2000	50	Yes
		17554+00	56	CF3	1787878.67	13357931.98	2	Construction	No	No	1500 - 2000	50	Yes
		17744+00	60	CF4	1799460.11	13343515.19	2	Construction/Camp	Yes	No	1200 - 1500	50	Yes
			Well Sites	4		Wells Total	8						



Well Siting Explanations (Rev.1 Alignment)

Appendix B

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Clover Valley 204					
Clover Valley					
Clover Valley	ECC/CS1a	20250+00	118	CIV2	Dual-use site with 2 wells proposed for permanent facility and construction demand. Depth to groundwater between 10 - 100' bgs. Target groundwater production from shallow alluvium sands and gravels, but may encounter ash-flow sedimentary tuff (bedrock) at depths between 200 - 300' bgs. This site is one of two proposed well sites for Panaca Valley demand station 20250+00
Clover Valley					
Clover Valley		Quarry CA-11	24	CIV5	Site along large northeast fracture trace in volcanics.
Clover Valley		Quarry CA-12	24	CIV1	Dual-use site with 2 wells proposed for quarry and construction demand. Depth to groundwater between 10 - 100' bgs. Target groundwater production from shallow alluvium sands and gravels, but may encounter ash-flow sedimentary tuff (bedrock) at depths between 200 - 300' bgs.
Panaca Valley 203					
Panaca Valley					
Panaca Valley	CAL/CS1a	1145+00	60	PanV4	Shallow groundwater <50 bgs, single well to serve as dual-use construction / permanent facility (domestic), sited near inferred fault within mapped silica ash-flow tuff with apparent secondary porosity resulting from fractures. Nearby flowing wells <1 mile up to 1,000 gpm reported when completed in 1960s.
		1390+00	1	PanV5	Depth to water 50 to 100' anticipated available yield > 200 gpm, sited in Meadow Valley Wash alluvial deposits
		1500+00	20	PanV26	Depth to water 25 to 50 feet, est. well depth 75 - 100 feet, single low-demand well for temporary work camp
		1648+00	97	PanV6	Depth to water 25 to 50 feet est. well depth 100 - 150 feet, construction well site moved out of ROW due to potential impact to the west, well is sited adjacent to mapped consolidated material, bedrock could be encountered at shallow depths, production capacity will depend on extent of saturated alluvium
				PanV7	Potential depth to GW = 40 - 60', several irrigation wells within 1.5 miles of the site producing well over 1,000 gpm, tuffaceous rocks present and generally logged at 120 to 160 feet (bgs)
		1948+00	136	PanV11	Potential depth to GW = 50 - 100', few wells nearby with little information, closest well yields 150 gpm and is completed to 100', location is situated in unconsolidated alluvial deposits adjacent to tuffaceous sedimentary rocks, known spring located 1.7 miles northwest of demand point
				PanV12	Potential depth to GW = 50 - 100', few wells nearby with little information, closest well yields 150 gpm and is completed to 100', location is situated in unconsolidated alluvial deposits adjacent to tuffaceous sedimentary rocks, known spring located 1.2 miles north of well site, sited 1 mile south of mapped fault zone east of Highland Ranch
		2098+00	72	PanV15	Potential depth to GW = 50 - 100', this site should be drilled first before drilling near the actual demand location at Bennett Pass in consolidated rock formation (no information available), approx. 3,900 feet west of Bennett Springs in alluvial sediments
				PanV16	Unknown depth to groundwater, may intersect N-S trending faults in consolidated limestone/dolomite carbonates, drill if point PanV15 is not feasible as proposed
Panaca Valley					
Panaca Valley	ECC/CS1a	1648+00	90	PanV8	Potential depth to GW = 40 - 60', several irrigation wells within 1.5 miles of the site producing well over 1,000 gpm, tuffaceous rocks present and generally logged at 120 to 160 feet (bgs)
		1948+00	140	PanV9	Potential depth to GW = 50 - 100', few wells nearby with little information, closest well yields 150 gpm and is completed to 100', location is situated in unconsolidated alluvial deposits adjacent to tuffaceous sedimentary rocks, known spring located 1.7 miles northwest of demand point
				PanV10	Potential depth to GW = 50 - 100', few wells nearby with little information, closest well yields 150 gpm and is completed to 100', location is situated in unconsolidated alluvial deposits adjacent to tuffaceous sedimentary rocks, known spring located 1.2 miles west of well site
		20250+00	117	PanV1	Potential depth to GW = 75 - 100', several domestic wells within 2 miles of the site, should avoid drilling in mapped sedimentary rocks to the east of CRC, potential for impact to existing wells, off CRC and near visible road from high-res ortho. This site is one of two proposed well sites for Panaca Valley demand station 20250+00, the other site is in Clover Valley

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Panaca Valley	ECC/CS1a	20420+00	1	PanV24	Potential depth to GW = 50 - 75', several irrigation wells within 2 miles of the site, yield appears to decrease and depth to GW appears to increase with distance from Meadow Valley Wash area, should avoid drilling in mapped sedimentary rocks to the east of CRC, single low-demand well for permanent facility
		20450+00	90	PanV2	Potential depth to GW = 50 - 75', several irrigation wells within 2 miles of the site, yield appears to decrease and depth to GW appears to increase with distance from Meadow Valley Wash area, should avoid drilling in mapped sedimentary rocks to the east of CRC, construction well site moved out of ROW due to potential impact to
		20450+00		PanV3	Depth to water 25 to 50 feet est. well depth 100 - 150 feet, construction well site moved out of ROW due to potential impact to the west, well is sited adjacent to mapped consolidated material, bedrock could be encountered at shallow depths, production capacity will depend on extent of saturated alluvium
		20520+00	20	PanV25	Depth to water 25 to 50 feet, est. well depth 75 - 100 feet, single low-demand well for temporary work camp
		2098+00	74	PanV13	Potential depth to GW = 50 - 100', this site should be drilled first before drilling near the actual demand location at Bennett Pass in consolidated rock formation (no information available), approx. 3,900 feet west of Bennett Springs in alluvial sediments
				PanV14	Unknown depth to groundwater, intersect N-S trending faults in consolidated limestone/dolomite carbonates, drill if point PanV13 is not feasible as proposed
Panaca Valley					
Panaca Valley		Quarry CA-8A	24	PanV20	Quarry demand only, nearby wells MUN wells yield 200 to 900 gpm, completed in alluvial fill to total depth with potential to encounter andesitic/quartzite bedrock formation at approximately 200'
		Quarry CA-8B	24	PanV23	Quarry demand only, located within mapped Andesite geologic unit, 0.6 miles east of proposed plant site (along existing trails) and 0.2 miles west of a USGS well that is reported as artesian, est. depth to water 50 to 250 feet (based on topography).
Dry Lake Valley - 181					
Dry Lake Valley					
Dry Lake Valley	CS1a/CS1b	2370+00	138	DLV1	Potential depth to GW = 750', little information available in this area, consolidated volcanic and carbonate rock contact, spring with permitted surface water diversion nearby.
				DLV2	Potential depth to GW = 400 to 500', little information available in area, situated within mapped alluvial material between carbonate rocks to the NE and SW of site, aligned with mapped N-S trending fault to the north in mapped carbonate (limestone/dolomite) rock and alluvial interface.
		2820+00	99	DLV3	Potential depth to GW = 150 - 250', evidence of water at surface near edge of ROW, MX wells completed 13 miles south adjacent to the same Dry Lake fault structure were tested at 500 gpm, highly variable hydrogeologic conditions with another well in same area being tested at 15 gpm, site well adjacent to Dry Lake fault on minor roads.
		3120+00	74	DLV4	Potential depth to GW = 200 - 300'. MX wells completed 13 miles south adjacent to the East Dry Lake fault structure were tested at 500 gpm. Highly variable hydrogeologic conditions with another well in same area being tested at 15 gpm. Site well adjacent to West Dry Lake fault to serve as multi-purpose well for construction and permanent demand at rail siding located and Rattlesnake Rd construction camp. Carbonate aquifer well 3 miles to northwest has water at 678 feet depth.
		3370+00	75	DLV5	Well sited within mapped dolomite/limestone rock of carbonate origin. An SNWA monitoring well >1 mile NE of site was drilled to 1,500 ft (bgs) and completed in Guillemette formation of lower Paleozoic Carbonate rocks. Unlikely groundwater development in alluvial fill based on apparent limited saturated thickness, where saturated, depth to groundwater in this area may be on the order of 750 to 800 ft (bgs) in alluvium. Based on nearby SNWA monitoring well, depth to water in carbonate rocks may be on the order of 650 to 700 ft (bgs).
				DLV6	1 well sited within mapped welded and non-welded ash flow tuff underlain by the upper paleozoic carbonate rocks, located along an extension of inferred fault mapped within the North Pahroc Range. Well is sited approx. 1.5 miles SE of Deadman, Coal and Hamilton Springs and approx. 1.5 miles east of Black Rock Spring, spring water may be of carbonate origin. Nearest well is approx. 2 miles east and is a carbonate monitoring well constructed by SNWA with depth to groundwater measured at 678 feet depth.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Pahroc Valley 208					
Pahroc Valley					
Pahroc Valley	CS1b/WR1	3598+00	123	PahV1	Site 1 well in ROW approx. 2.5 miles SW of Deadman, Coal and Hamilton Springs and approx. 1.4 miles NW of Black Rock Spring, location situated in geologic formation mapped as dolomite and limestone formation which are probably part of the regional carbonate system. Water originating from carbonate rocks appear to be the source for nearby springs. Location is situated within North Pahroc Range where several range front strike slip faults have been mapped, along extension of White River Fault a few miles north of site. Potential for groundwater development will likely depend on the extent of secondary porosity resulting from faulting within fractured rock formations. Little is known about potential depth to groundwater in this area.
				PahV2	Site 2 wells in ROW approx. 3 miles SW of Deadman, Coal and Hamilton Springs and approx. 2 miles NW of Black Rock Spring, location situated in geologic contact between formations mapped andesite and dolomite/limestone formation which are probably part of the regional carbonate system. Water originating from carbonate rocks appear to be the source for nearby springs. Location is situated within North Pahroc Range where several range front strike slip faults have been mapped, along extension of White River Fault a few miles north of site. Potential for groundwater development will likely depend on the extent of secondary porosity resulting from faulting within fractured rock formations. Little is known about potential depth to groundwater in this area.
				PahV3	1 well, located 6,300 ft of ROW in alluvial sediments, approx. depth to groundwater = 500 to 600'.
		3748+00	274	PahV4	2 wells located approx. 4500 ft west of demand station. Approx. depth to groundwater = 400 to 500' in valley fill alluvium.
				PahV5	2 wells sited within ROW. Little information available in this area. May be limited saturated alluvium available. However, potentially favorable conditions may exist with secondary porosity from range front block faulting and fractured consolidated rock with depth. Well depth dependent on depth in which fractured paleozoic rocks are encountered.
				PahV6	2 wells sited within ROW. Existing well completed approx. 6,500 feet to NW indicated that bedrock may have been encountered at 300 ft (bgs) with groundwater depth at 160', the well tested at 60 gpm with no reported drawdown, may have been completed in carbonate rocks. Groundwater production from alluvial basin fill unlikely at this location, target aquifer is paleozoic carbonate rocks.
		3937+76	244	PahV7	2 wells sited within ROW. Existing well completed approx. 2800 feet south indicated that bedrock may have been encountered at 300 ft (bgs) with groundwater depth at 160', the well tested at 60 gpm with no reported drawdown, may have been completed in carbonate rocks. Groundwater production from alluvial basin fill unlikely at this location, target aquifer is paleozoic carbonate rocks.
				PahV8	2 miles west of ROW, 1 well sited within block-faulted Paleozoic carbonates that are well-exposed in the Seaman Range. A carbonate well completed approx. 2 miles west of this site was tested at 300gpm.
				PahV9	2 wells sited within ROW, alluvial fill may be shallow and unsaturated at this location. Little information in this area. Target aquifer is carbonate rocks.
		4139+00	89	PahV10	Site 1 well. Based on information from wells within 2 miles east of site anticipated depth to groundwater is approx. 300 to 400 ft (bgs), well to be completed in valley fill alluvium.
			50	PahV11	Site 1 well. Based on information from wells within 2 miles east of site anticipated depth to groundwater is approx. 300 to 400 ft (bgs), well to be completed in valley fill alluvium.
White River Valley 207					
White River Valley					
White River Valley	CS1b/WR1	4725+00	20	WRV2	1 well sited near proposed construction camp, few wells completed in this part of southern White River Valley, estimated depth to groundwater = 100 to 200 ft (bgs) in potentially thin valley fill alluvium, favorable groundwater conditions may be encountered in underlying fractured carbonate rocks at depths that may be less than 400 ft (bgs)
		4799+00	47	WRV1	1 dual purpose (construction and siding) well sited near proposed siding along mapped Murphy Meadows fault, few wells completed in this part of southern White River Valley, estimated depth to groundwater = 100 to 200 ft (bgs) in potentially thin valley fill alluvium, favorable groundwater conditions may be encountered in underlying fractured carbonate rocks at depths that may be less than 400 ft (bgs)
Coal Valley 171					
Coal Valley					
Coal Valley	CS1-WR1/GV1	5149+00	35	CoV3	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet).
		5623+00	30	CoV4	This Demand Station is located near the valley margin, and the valley fill deposits will be relatively thin and unsaturated. Therefore, the main targeted aquifer will be the underlying Paleozoic carbonates. To minimize the amount of surface casing, the selected well locations should be located as close to the valley margin as possible.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev. 1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Coal Valley					
Coal Valley	CS1-WR1/GV2	28216+00	72	CoV6	Site is in valley fill.
		5149+00	38	CoV5	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet).
Coal Valley					
Coal Valley	CS1-WR1/GV3	29818+00	26	CoV8	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet).
		5149+00	40	CoV7	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet).
Coal Valley					
Coal Valley	CS1-WR1/GV8	5149+00	32	CoV1	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet).
		56198+00	61	CoV2	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet).
Garden Valley 172					
Garden Valley					
Garden Valley	GV1	5882+00	42	GV10	Site is in valley fill.
		6232+00	79	GV9	Site is in valley fill.
		6532+00	84	GV11	Site is in valley fill.
Garden Valley					
Garden Valley	GV2	28496+00	64	GV2	Site is in valley fill.
		28996+00	39	GV3	Site is in valley fill.
		29020+00	20	GV1	Site is in valley fill.
Garden Valley					
Garden Valley	GV3	30248+00	56	GV13	This Demand Location is located in the northern portion of Garden valley, and the targeted aquifer will be valley fill deposits. Typical well depths in this area range from 200-300 feet deep.
		30648+00	43	GV14	Site is in valley fill.
		30850+00	20	GV12	Well for construction camp. Site is in valley fill.
		30948+00	49	GV15	Site is in valley fill.
Garden Valley					
Garden Valley	GV8	56477+00	62	GV5	Site is in valley fill. Retain one well for siding.
		56930+00	20	GV4	Site is in valley fill.
		56977+00	38	GV6	Site is in valley fill.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Penoyer Valley 170					
Penoyer Valley					
Penoyer Valley	CS2a	6588+00	39	PeV1	Proposed well site is in alluvium located off of CRC. Demand location is in poor location for obtaining water.
		6988+00	44	PeV2	Proposed well site is in alluvium located off of CRC. Demand location is in poor location for obtaining water.
		7170+00	1	PeV4	Proposed site is in alluvium in channel between two large outcrops of Tertiary volcanics.
		7389+00	36	PeV3	Proposed well site is in alluvium located off of CRC. Demand location is in poor location for obtaining water.
Railroad Valley South 173A					
Railroad Valley South					
Railroad Valley South	CS2a- CS2b/SR2/CS3	36048+00	65	RrV2	Site located in valley fill.
		36248+00	42	RrV3	Site located in valley fill at toe of alluvial fan.
		7670+00	20	RrV1	construction camp well. Site is in valley fill.
		8535+00	1	RrV11	Site located in valley fill at toe of alluvial fan. For siding only.
		8748+00	34	RrV4	Site located in valley fill at toe of alluvial fan. No nearby wells.
Railroad Valley South					
Railroad Valley South	CS2a- CS2b/SR3/CS3	7670+00	20	RrV1	construction camp well. Site is in valley fill.
		7972+00	65	RrV5	Demand location is at gap in ranges. No nearby wells or water rights. Local faulting may be significant. Locate wells in dry washes & faults on existing roadways to east on north side of ROW.
		8548+00	38	RrV6	Site located in valley fill at toe of alluvial fan. No nearby wells. Save one well for siding.
		8748+00	16	RrV7	Site located in valley fill at toe of alluvial fan. No nearby wells.
Railroad Valley South					
Railroad Valley South		Quarry NN-9A	24	RrV10	Site in alluvial channel between two large volcanic hills. Its unclear whether the volcanics are older rocks extending through alluvium or interbedded with it.
		Quarry NN-9B	24	RrV8	Site located in valley fill.
Hot Creek Valley 156					
Hot Creek Valley					
Hot Creek Valley	CS3	9156+00	91	HC2	Site is in valley fill.
		9606+00	88	HC4	Demand location is @ head of alluvium. One nearby water right - low apparent potential for conflict due to low demand. Locate wells a) @ dry washes on downslope side of ROW or b) @ dry washes on downslope side of ROW @ mouth of Cow Canyon.
		9906+00	165	HC5	Site is in valley fill.
				HC7	Site is in valley fill.
Hot Creek Valley					
Hot Creek Valley		Quarry NN-8D	24	HC1	Site is in valley fill on road that will become the quarry access road.
		Quarry NN-8C	24	HC3	Site is in valley fill.
		Quarry NN-8B	24	HC6	Site is in valley fill.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Stone Cabin Valley 149					
Stone Cabin Valley					
Stone Cabin Valley	CS3	9985+00	1	SCV7	Site is in volcanics to supply only siding. No data on groundwater depth.
		10144+00	55	SCV1	Site is in valley fill west of range front fault. Nearest well 2 miles west.
		11044+00	53	SCV2	Site is in Valley fill. Nearest well is more than 1 mile north.
		11544+00	34	SCV3	Demand location is in flat alluvium area w/ braided dry washes. Multiple irrigation wells to east and northeast, potential water conflicts. Locate wells on south side of ROW.
		10755+00	20	SCV4	Well site in valley fill.
Stone Cabin Valley					
Stone Cabin Valley		Quarry NN-8A	34	SCV6	
Ralston Valley 141					
Ralston Valley					
Ralston Valley	CS3/GF1	11904+00	46	RaV1	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm. Locate wells on downslope side of ROW.
		12153+00	20	RaV14	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm.
		12534+00	31	RaV2	Demand location is in alluvium btw andesite/basalt pinnacles ~ 1700m from playa. No nearby wells or water rights. Locate wells @ dry washes @ margin of ROW.
		MOW 11740	2	RaV3	One permanent well to provide 200kgal/year (.4 gpm) for MOW.
Ralston Valley					
Ralston Valley	CS3/GF3	11904+00	58	RaV7	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm. Locate wells on downslope side of ROW.
		12153+00	20	RaV16	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm.
		52298+00	126	RaV8	Demand location is in alluvium btw andesite/basalt pinnacles. No nearby wells or water rights. High risk for adequate water.
				RaV9	Demand location is in alluvium btw andesite/basalt pinnacles. No nearby wells or water rights. High risk for adequate water.
		52448+00	173	RaV10	Demand location is in alluvium btw andesite/basalt pinnacles. No nearby wells or water rights. High risk for adequate water.
				RaV11	Demand location is in alluvium btw andesite/basalt pinnacles. No nearby wells or water rights. High risk for adequate water.
		52730+00	1	RaV13	High risk site for water in volcanics. May need to obtain water from another nearby well.
		52746+00	94	RaV12	Demand location is in alluvium btw andesite/basalt pinnacles. No nearby wells or water rights. High risk for adequate water.
		MOW 11740	2	RaV13	One permanent well to provide 200kgal/year (.4 gpm) for MOW.
Ralston Valley					
Ralston Valley	CS3/GF4	11904+00	43	RaV4	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm. Locate wells on downslope side of ROW.
		12153+00	20	RaV15	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm.
		42098+00	42	RaV5	Demand location is in alluvium btw andesite/basalt pinnacles ~ 1700m from playa. No nearby wells or water rights. Locate wells @ dry washes @ margin of ROW.
		MOW 11740	2	RaV6	One permanent well to provide 200kgal/year (.4 gpm) for MOW.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Ralston Valley					
Ralston Valley		Quarry NS-3A	24	RaV10	Wells in volcanic rocks - high risk
		Quarry NS-3A	24	RaV11	Wells in volcanic rocks - high risk Alternate site for Quarry NS-3A
		Quarry NS-3B	24	RaV9	Wells in volcanic rocks - high risk
Alkali Spring Valley 142					
Alkali Spring Valley					
Alkali Spring Valley	GF1	12802+00	66	ASV1	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
		13052+00	50	ASV2	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
Alkali Spring Valley					
Alkali Spring Valley	GF4	42478+00	53	ASV3	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
		42778+00	187	ASV4	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
				ASV5	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
				ASV8	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
		42978+00	216	ASV9	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
Alkali Spring Valley					
Alkali Spring Valley		Quarry ES-7	24	ASV6	Site located along NE striking fault zone in upper part of alluvial fan. Target is water in underlying fractured volcanics.
Alkali Spring Valley		Quarry ES-7	24	ASV7	Alternate well location located on alluvial fan adjacent to US 95. Save one well for siding.
Stonewall Flat 145					
Stonewall Flat					
Stonewall Flat	GF1	13290+00	191	StF1	Site along road in valley fill southeast of CRC.
				StF2	Site along road in valley fill southeast of CRC.
				StF3	Site along road in valley fill southeast of CRC.
		13590+00	49	StF4	This area should have alluvium extending to a greater depth than the adjacent area.
Stonewall Flat					
Stonewall Flat	GF3	52796+00	184	StF5	Site along road in valley fill southeast of CRC.
				StF6	Site along road in valley fill southeast of CRC.
				StF7	Site along road in valley fill southeast of CRC.
		52996+00	133	StF8	This area should have alluvium extending to a greater depth than the adjacent area.
				StF9	Possible alternative location to intersect deeper alluvium filled channel.
		53346+00	61	StF10	Tertiary tuffaceous volcanic rocks crop out as two hills one approximately 3,600 feet to the west of the CRC centerline at this location; the other approximately 4,000 feet northwest of the CRC centerline. An alluvium filled channel extends north-northwest of the site between the two hills. Alluvium will be deeper in this area than east or west of this location. Several north-northeast striking faults have been mapped cutting these two hills and could serve to transmit groundwater to the alluvium in this area. Siting a well at station 136200+00 positioned towards the east edge of the CRC (488884mE, 4164049mN) will put the well within the area of this channel. This area should have alluvium extending to a greater depth than the adjacent area.
Stonewall Flat					
Stonewall Flat	GF4	43542+00	35	StF11	Well site in alluvium. No nearby wells.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Lida Valley 144					
Lida Valley					
Lida Valley	GF1/CS4/BC2	13775+00	20	LV19	Construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
		14028+00	58	LV13	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
				LV14	Site is in valley fill.
		44098+00	63	LV15	Well site in valley fill.
				LV16	Well site in valley fill.
		44282+00	62	LV17	Well site in valley fill.
				LV18	Well site in valley fill.
Lida Valley					
Lida Valley	GF1/CS4/BC3	13775+00	20	LV8	Construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
		14028+00	64	LV5	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
				LV6	Site is in valley fill.
		14448+00	45	LV7	A few small stock wells lie near the CRC in the Lida Valley Basin but no aquifer test data is available. All of these produce water from valley fill.
Lida Valley					
Lida Valley	GF3/CS4/BC2	13775+00	20	LV19	Construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
		14028+00	67	LV13	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
				LV14	Site is in valley fill.
		44098+00	63	LV15	Well site in valley fill.
				LV16	Well site in valley fill.
		44282+00	61	LV17	Well site in valley fill.
				LV18	Well site in valley fill.
Lida Valley					
Lida Valley	GF3/CS4/BC3	13775+00	20	LV8	Construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
		14028+00	73	LV5	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
				LV6	Site is in valley fill.
		14448+00	45	LV7	A few small stock wells lie near the CRC in the Lida Valley Basin but no aquifer test data is available. All of these produce water from valley fill.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev 1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Lida Valley					
Lida Valley	GF4/CS4/BC2	13775+00	20	LV8	Construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
		14028+00	48	LV13	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
				LV14	Site is in valley fill.
		43102+00	49	LV9	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
				LV10	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
		43302+00	69	LV11	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
				LV12	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
		44098+00	64	LV15	Well site in valley fill.
				LV16	Well site in valley fill.
		44282+00	62	LV17	Well site in valley fill.
				LV18	Well site in valley fill.
Lida Valley					
Lida Valley	GF4/CS4/BC3	13775+00	20	LV8	Construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
		14028+00	57	LV5	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
				LV6	Site is in valley fill.
		14448+00	47	LV7	A few small stock wells lie near the CRC in the Lida Valley Basin but no aquifer test data is available. All of these produce water from valley fill.
		43102+00	48	LV1	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
				LV2	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
		43302+00	67	LV3	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
				LV4	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev 1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Sarcobatus Flat 146					
Sarcobatus Flat					
Sarcobatus Flat	BC2/CS5	15200+00	81	SaF9	Supply construction camp as well as demand point.
		15550+00	66	SaF10	The proposed site should be placed near the southwestern edge of the CRC adjacent to US 95 . Groundwater should be encountered at this location in valley fill between 40 and 100 feet based the nearest 2 wells that are 4 miles south and 4 miles to the southeast of the proposed site and at a similar elevation. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
		15950+00	78	SaF11	*Groundwater should be encountered at this location in valley fill between 50 and 150 feet based the nearest well which lies 3,000 feet to the southeast of the proposed site and at a similar elevation. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
		44582+00	77	SaF8	Proposed site in valley fill. Nearest well is 2 miles south with water depth of 135 feet.
Sarcobatus Flat					
Sarcobatus Flat	BC3/CS5	14688+00	92	SaF1	Generally in the Sarcobatus Flat Basin groundwater will be encountered at one or more zones within the alluvial materials. Partial confinement of water-bearing zones is common in alluvial basins in Nevada so that actual depths to producing zones may be more than this. In addition, it is advisable to intersect multiple water producing zones so that a large thickness of aquifer is exposed to the well screen. This increases the probability that wells will have a higher productive capacity. In general useable quantities of water may be expected in the valley fill along much of the CRC within Sarcobatus Flat basin as long as its not in an area close to bedrock exposures where the alluvium is too thin to permit a reasonable saturated thickness above bedrock. The proposed site should be placed near the southern edge of the CRC in order to ensure an adequate thickness of saturated valley fill for productive wells. Groundwater should be encountered at this location in valley fill between 100 and 200 feet based on wells near Scotty's Junction, the nearest of which is 4.4 miles to the southeast of the proposed site. Production capacity in excess of 200 gpm per well is possible.
				SaF2	Generally in the Sarcobatus Flat Basin groundwater will be encountered at one or more zones within the alluvial materials. Partial confinement of water-bearing zones is common in alluvial basins in Nevada so that actual depths to producing zones may be more than this. In addition, it is advisable to intersect multiple water producing zones so that a large thickness of aquifer is exposed to the well screen. This increases the probability that wells will have a higher productive capacity. In general useable quantities of water may be expected in the valley fill along much of the CRC within Sarcobatus Flat basin as long as its not in an area close to bedrock exposures where the alluvium is too thin to permit a reasonable saturated thickness above bedrock. The proposed site should be placed near the southern edge of the CRC in order to ensure an adequate thickness of saturated valley fill for productive wells. Groundwater should be encountered at this location in valley fill between 100 and 200 feet based on wells near Scotty's Junction, the nearest of which is 4.4 miles to the southeast of the proposed site. Production capacity in excess of 200 gpm per well is possible.
		14888+00	52	SaF3	Generally in the Sarcobatus Flat Basin groundwater will be encountered at one or more zones within the alluvial materials. Partial confinement of water-bearing zones is common in alluvial basins in Nevada so that actual depths to producing zones may be more than this. In addition, it is advisable to intersect multiple water producing zones so that a large thickness of aquifer is exposed to the well screen. This increases the probability that wells will have a higher productive capacity. In general useable quantities of water may be expected in the valley fill along much of the CRC within Sarcobatus Flat basin as long as its not in an area close to bedrock exposures where the alluvium is too thin to permit a reasonable saturated thickness above bedrock. The proposed site should be placed near the southern edge of the CRC in order to ensure an adequate thickness of saturated valley fill for productive wells. Groundwater should be encountered at this location in valley fill between 100 and 200 feet based on wells near Scotty's Junction, the nearest of which is 4.4 miles to the southeast of the proposed site. Production capacity in excess of 200 gpm per well is possible.
				SaF4	No data on groundwater depth.
				SaF5	Supply construction camp only
				SaF6	The proposed site should be placed near the southwestern edge of the CRC adjacent to US 95 . Groundwater should be encountered at this location in valley fill between 40 and 100 feet based the nearest 2 wells that are 4 miles south and 4 miles to the southeast of the proposed site and at a similar elevation. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
				SaF7	*Groundwater should be encountered at this location in valley fill between 50 and 150 feet based the nearest well which lies 3,000 feet to the southeast of the proposed site and at a similar elevation. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
		15950+00	78		

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Oasis Valley	228				
Oasis Valley					
Oasis Valley	CS5/OV1/CS6	16200+00	34	OV1	Likely low yielding wells in volcanics.
				OV2	Likely low yielding wells in volcanics.
		16344+00	109	OV3	The proposed site should be placed near the eastern edge of the CRC in order to avoid a large wetland area caused by springs. Groundwater should be encountered at this location in valley fill between 10 and 50 feet based on three existing wells, 1,200 feet to the south-southwest, 1,900 feet to the south-southeast, and 1,900 feet to the east of the proposed site. Groundwater is very shallow here caused by a fault zone that dams southwestward flowing groundwater in underlying volcanic rocks from Pahute Mesa area. Drilling depths to ensure intersection of reliable production should be 50 to 100 feet. Production capacity in excess of 50 gpm per well is highly probable based on typical characteristics of valley fill alluvial aquifers in the area. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use.
				OV4	The proposed site should be placed near the eastern edge of the CRC in order to avoid a large wetland area caused by springs. Groundwater should be encountered at this location in valley fill between 10 and 50 feet based on three existing wells, 1,200 feet to the south-southwest, 1,900 feet to the south-southeast, and 1,900 feet to the east of the proposed site. Groundwater is very shallow here caused by a fault zone that dams southwestward flowing groundwater in underlying volcanic rocks from Pahute Mesa area. Drilling depths to ensure intersection of reliable production should be 50 to 100 feet. Production capacity in excess of 50 gpm per well is highly probable based on typical characteristics of valley fill alluvial aquifers in the area. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use.
				OV24	Well site in alluvial aquifer. Alternate well site location for OV3 and OV4.
				OV25	Well site in alluvial aquifer. Alternate well site location for OV3 and OV4.
		16410+00	20	OV9	Construction camp. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use. High potential for conflict with existing water users.
		16494+00	40	OV5	Groundwater should be encountered at this location in valley fill between 10 and 50 feet based on three existing wells in the area. Groundwater is very shallow here caused by a fault zone that dams southwestward flowing groundwater in underlying volcanic rocks from Pahute Mesa area. Drilling depths to ensure intersection of reliable production should be 50 to 100 feet. Production capacity in excess of 50 gpm per well is highly probable based on typical characteristics of valley fill alluvial aquifers in the area. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use.
				OV26	Well site in alluvial aquifer. Alternate well site location for OV5.
		16718+00	132	OV6	Well site in in Soberup Gulch in alluvium. No existing road access. This site is an alternative to probable low yielding well sites located on the CRC. Use only if water can't be obtained along the CRC.
				OV7	No aquifer test data has been found for existing wells in volcanic rocks near the CRC. Wells in the area are monitoring wells to the north and east of the CRC and only shallow alluvial wells lie to the west of the CRC. Historically much of the groundwater used in the Oasis Valley basin has come from springs and shallow dug wells in the alluvium. The largest production wells in the basin are a part of the Beatty Water and Sanitation system where individual wells yield from 80 to 275 gpm from alluvium in the Bullfrog Hills. - This demand location is situated in an area underlain by Tertiary volcanic rocks. The area surrounding these locations is devoid of any wells so that there is no specific data to evaluate the potential for viable wells in this area on the CRC. 2 wells in volcanics no data to specify wells. Possible water production from intersecting faulted areas in the volcanics. It is designed to intersect a low angle west-dipping detachment fault (possibly water-bearing) whose trace passes through station 16755. High risk to produce significant water.
				OV22	No data near this site to specify wells. This site is in volcanic rocks approximately 1/4 mile west of the CRC at station 16755. It is designed to intersect a low angle west-dipping detachment fault (possibly water-bearing) whose trace passes through station 16755. High risk to produce significant water.
				OV8	Well site in in Soberup Gulch in alluvium. No existing road access. This site is an alternative to probable low yielding well sites located on the CRC. Use only if water can't be obtained along the CRC.
Oasis Valley					
Oasis Valley	CS5/OV3/CS6	16200+00	55	OV10	Likely low yielding wells in volcanics.
				OV11	Likely low yielding wells in volcanics.
		16718+00	136	OV14	Well site in in Soberup Gulch in alluvium. No existing road access. This site is an alternative to probable low yielding well sites located on the CRC. Use only if water can't be obtained along the CRC.
				OV15	No aquifer test data has been found for existing wells in volcanic rocks near the CRC. Wells in the area are monitoring wells to the north and east of the CRC and only shallow alluvial wells lie to the west of the CRC. Historically much of the groundwater used in the Oasis Valley basin has come from springs and shallow dug wells in the alluvium. The largest production wells in the basin are a part of the Beatty Water and Sanitation system where individual wells yield from 80 to 275 gpm from alluvium in the Bullfrog Hills. - This demand location is situated in an area underlain by Tertiary volcanic rocks. The area surrounding these locations is devoid of any wells so that there is no specific data to evaluate the potential for viable wells in this area on the CRC. 2 wells in volcanics no data to specify wells. Possible water production from intersecting faulted areas in the volcanics. It is designed to intersect a low angle west-dipping detachment fault (possibly water-bearing) whose trace passes through station 16755. High risk to produce significant water.

PROPOSED WELL SITES
BY BASIN AND ROUTE - Rev.1 Alignment (Comments)

Basin	Route	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
				OV23	No data near this site to specify wells. This site is in volcanic rocks approximately 1/4 mile west of the CRC at station 16755. It is designed to intersect a low angle west-dipping detachment fault (possibly water-bearing) whose trace passes through station 16755. High risk to produce significant water.
				OV16	Well site in in Soberup Gulch in alluvium. No existing road access. This site is an alternative to probable low yielding well sites located on the CRC. Use only if water can't be obtained along the CRC.
Oasis Valley	CS5/OV3/CS6	46200+00	174	OV12	Wells sites in Tertiary sediments. Likely low yielding wells.
				OV18	Wells sites in Tertiary sediments. Likely low yielding wells.
				OV19	Wells sites in Tertiary sediments. Likely low yielding wells.
				OV20	Wells sites in Tertiary sediments. Likely low yielding wells.
				OV21	Wells sites in Tertiary sediments. Likely low yielding wells.
		46315+00	20	OV17	Site well in alluvial channel along existing road near margin of CRC in Tertiary sediments.
		46450+00	89	OV13	Groundwater should be encountered at this location in valley fill between 10 and 50 feet based on three existing wells in the area. Groundwater is very shallow here caused by a fault zone that dams southwestward flowing groundwater in underlying volcanic rocks from Pahute Mesa area. Drilling depths to ensure intersection of reliable production should be 50 to 100 feet. Production capacity in excess of 50 gpm per well is highly probable based on typical characteristics of valley fill alluvial aquifers in the area. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use.
				OV24	Well site in alluvial aquifer. Alternate well site location for OV13.
Crater Flat 229					
Crater Flat					
Crater Flat	BW1	17054+00	61	CF1	Based on other wells in the basin the static water level at this site should be between 900 and 1,000 feet below surface with actual depths to water producing zones even greater. The nearest two production wells (Crater Flat 1 and PW-2) located 3 miles to the northwest extend to depths of 1,600 to 2,100 feet. Assuming that specific capacities of new wells are similar to well PW-2 then at least 200 feet of water column would be needed to supply a 50 gpm production rate.
		17404+00	36	CF2	Based on other wells in the basin the static water level at these sites should be between 800 and 1,000 feet below surface with actual depths to water producing zones even greater. The nearest two wells are located 2.2 miles west (well VH-2) and 1.4 miles southwest (well VH-1). The most productive water zone in VH-1 was at a depth of approximately 1,900 feet so well depths of 2,000 feet are suggested for this location. Pump test results on well VH-1 suggest that a production rate of 50 gpm is a reasonable expectation for wells at this site.
		17554+00	56	CF3	Based on other wells in the basin the static water level at these sites should be between 800 and 1,000 feet below surface with actual depths to water producing zones even greater. The nearest two wells are located 1.5 miles northeast (well WT-10) and 3 miles west (well VH-1). The most productive water zone in VH-1 was at a depth of approximately 1,900 feet so well depths of 2,000 feet are suggested for this location. Pump test results on well VH-1 suggest that a production rate of 50 gpm is a reasonable expectation for wells at this site.
		17744+00	60	CF4	Based on other wells in the basin the static water level at these sites should be between 800 and 1,000 feet below surface with actual depths to water producing zones even greater. The nearest two wells are located 2.1 miles north (well WT-11) and 1-mile northeast (well VH-10). Water levels in these wells and a monitoring well EWDP-18P 0.4 miles east, suggest that the static water level at this site will be in the range of 900 to 1,100 feet. A minimum depth for these wells is 1,100 to 1,300 feet although it may be necessary to drill significant deeper to intersect a sufficiently productive fractured rock aquifer. Insufficient data is available to further define this depth. Wells sited near fault zone.



Proposed CRC Well Table (USGS Alignment)

Appendix C

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Clover Valley 204														
Clover Valley														
Clover Valley	ECC	ECC	20040+00	1	CIV1	728500	4165924	1	Permanent Facility	Yes	Yes	100	10	Yes
			20090+00	98	CIV2	727353	4166322	2	Construction	No	No	350	50	Yes
					CIV3	726705	4166666	1	Construction	No	No	350	50	Yes
							Wells Total	4						
Clover Valley														
Clover Valley		Quarry	Quarry CA-12	24	CIV4	728511	4165940	2	Quarry	No	No	100	20	Yes
			Quarry CA-11	24	CIV5	738156	4165018	2	Quarry	No	No	300	20	No
							Wells Total	4						
Panaca Valley 203														
Panaca Valley														
Panaca Valley	ECC/CS1	ECC	20330+00	37	PanV1	725506	4173103	1	Construction	No	No	250	100	No
					PanV2	725697	4174633	1	Construction	No	No	250	100	Yes
			20465+00	38	PanV3	725544	4177114	1	Construction/Permanent Facility	Yes	Yes	200	200	Yes
			20545+00	20	PanV4	725961	4179217	1	Camp	Yes	No	75 - 100	20	Yes
		CS1	1610+00	95	PanV5	724732	4182001	1	Construction	No	No	200	1000	Yes
			1775+00	95	PanV6	719637	4183897	1	Construction	No	No	100 - 200	50 - 100	Yes
			2099+00	96	PanV7	716572	4184485	1	Construction/Permanent Facility	No	Yes	100 - 200	50	Yes
					PanV9	715164	4186480	1	Construction/Permanent Facility	No	Yes	500	50	Yes
							Wells Total	8						
Panaca Valley														
Panaca Valley	CAL/CS1	CAL	1042+00	2	PanV10	719915	4167140	1	Permanent Facility	Yes	Yes	50 - 75	50	Yes
			1200+00	19	PanV11	721671	4171128	1	Permanent Facility	Yes	Yes	50 - 100	<20	Yes
					PanV12	721813	4171503	1	Construction	No	No	50 - 100	<20	Yes
			1442+00	7	PanV13	724819	4177613	1	Construction	No	No	125 - 150	200	Yes
		CS1	1600+00	95	PanV14	724732	4182001	1	Construction	No	No	200	1000	Yes
			1700+00	95	PanV15	722764	4182649	1	Construction	No	No	300 - 400	50 - 100	No
					PanV16	722318	4182495	2	Construction	No	No	300 - 400	<50	Yes
			1785+00	95	PanV17	719637	4183897	1	Construction	No	No	100 - 200	50 - 100	Yes
							Wells Total	9						

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Panaca Valley		Quarry												
Panaca Valley		Quarry	Quarry CA-8A	24	PanV20	719395	4167543	1	Quarry	No	No	175 - 200	200	No
			Quarry CA-8B	24	PanV23	721346	4172839	1	Quarry	No	No	250 - 500	<100	No
							Wells Total	2						
Dry Lake Valley 181														
Dry Lake Valley	CS1													
Dry Lake Valley	CS1	CS1	2285+00	90	DLV1	710212	4183797	1	Construction	No	No	1000 - 1500	50	Yes
					DLV2	709985	4182996	1	Construction	No	No	1000 - 1500	50	Yes
			2385+00	90	DLV3	708173	4183712	1	Construction	No	No	750 - 1250	50	Yes
					DLV4	706655	4184483	1	Construction	No	No	750 - 1250	50	Yes
			2805+00	90	DLV5	700453	4189393	1	Construction	No	No	500 - 1000	50 - 100	Yes
			2885+00	115	DLV6	694653	4190898	1	Construction	No	No	750 - 1250	50	Yes
					DLV7	690460	4191769	2	Construction/Camp/Siding	Yes	Yes	500 - 1000	50 - 100	Yes
							Wells Total	8						
Pahroc Valley 208														
Pahroc Valley														
Pahroc Valley	CS1 \ WR1/WR3	CS1	3512+00	182	DLV10	683083	4198739	1	Construction	No	No	<500	50	Yes
					DLV8	683179	4198083	1	Construction	No	No	<500	50	No
					DLV9	683153	4197950	1	Construction	No	No	<500	50	No
					PahV1	680840	4200421	1	Construction	No	No	500 - 1000	50	Yes
					PahV2	679112	4200924	1	Construction	No	No	800 - 1200	50	No
			3642+00	182	PahV3	680776	4202774	1	Construction	No	No	750 - 1250	50	Yes
					PahV4	679919	4203249	2	Construction	No	No	750 - 1250	50	Yes
					PahV5	679875	4204185	2	Construction	No	No	750 - 1250	50	Yes
					PahV6	679744	4208067	2	Construction	No	No	500 - 1000	50	Yes
		WR1	3822+00	182	PahV7	679008	4208909	2	Construction	No	No	500 - 1000	50	Yes
					PahV8	674943	4209500	1	Construction	No	No	250 - 500	50	No
					PahV10	670821	4218871	2	Construction/Siding	No	Yes	250 - 500	50	Yes
			4280+00	183	PahV11	669932	4219625	2	Construction	No	No	250 - 500	50	Yes
					PahV9	673018	4217379	1	Construction	No	No	250 - 500	50	Yes
					PahV12	666915	4221683	1	Construction	No	No	250 - 500	50	Yes
			4501+00	182	PahV12	666915	4221683	1	Construction	No	No	250 - 500	50	Yes

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Pahroc Valley	CS1 \ WR1/WR3	WR1	4501+00	182	PahV13	665756	4222998	2	Construction	No	No	250 - 500	50	Yes
					PahV14	664758	4223875	2	Construction	No	No	250 - 500	50	Yes
							Wells Total	25						
White River Valley 207														
White River Valley														
White River Valley	WR1/WR3	WR1	4700+34	20	WRV1	660161	4227288	1	Camp	Yes	No	200 - 300	20	Yes
			4795+00	137	WRV2	657477	4227500	1	Construction	No	No	250 - 500	50	Yes
					WRV3	656762	4227470	2	Construction	No	No	250 - 500	50	Yes
							Wells Total	4						
Coal Valley 171														
Coal Valley														
Coal Valley	WR1/WR3 \ WR3	WR1	5110+00	63	CoV1	650924	4223276	2	Construction	No	No	500	50	Yes
					CoV2	650790	4223020	1	Construction	No	No	500	50	Yes
			5320+00	63	CoV3	646714	4218171	2	Construction	No	No	500	50	Yes
					CoV4	646505	4218148	1	Construction	No	No	500	50	Yes
							Wells Total	6						
Coal Valley														
Coal Valley	WR1/WR3 \ WR3 \ GV2	WR1	5110+00	125	CoV1	650924	4223276	2	Construction	No	No	300-500	50	Yes
					CoV5	650790	4223020	2	Construction	No	No	300 - 500	50	Yes
		GV2	28110+00	7	CoV6	647394	4217205	2	Construction	No	No	300 - 500	10	Yes
			28275+00	7	CoV7	644654	4213263	2	Construction	No	No	300 - 500	10	Yes
			28340+00	7	CoV8	643921	4212214	2	Construction	No	No	300 - 500	10	Yes
							Wells Total	10						
Coal Valley														
Coal Valley	WR1/WR3 \ WR3 \ GV8	WR1	5110+00	125	CoV9	650924	4223276	2	Construction	No	No	300-500	50	Yes
					CoV10	650790	4223020	2	Construction	No	No	300 - 500	50	Yes
		GV8	56090+00	7	CoV11	647017	4217900	2	Construction	No	No	300 - 500	10	Yes
			56250+00	7	CoV12	644654	4213263	2	Construction	No	No	300 - 500	10	Yes
			56320+00	7	CoV13	643921	4212214	2	Construction	No	No	300 - 500	10	Yes
							Wells Total	10						

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Garden Valley 172														
Garden Valley														
Garden Valley	GV1	GV1	5600+00	7	GV6	636513	4215016	1	Construction/Siding	No	Yes	150 - 250	50	Yes
			5850+00	7	GV7	632853	4212048	1	Construction	No	No	150 - 250	50	Yes
			6050+00	7	GV8	628531	4208774	1	Construction	No	No	150 - 250	50	Yes
			6215+00	20	GV9	623737	4205847	1	Camp	Yes	No	400 - 500	50	Yes
			6300+00	7	GV10	623737	4205847	1	Construction	No	No	400-500	50	Yes
							Wells Total	5						
Garden Valley														
Garden Valley	GV2	GV2	28400+00	1	GV11	642056	4210588	1	Siding	No	Yes	400 - 500	1	Yes
			28752+00	22	GV13	633933	4207746	1	Construction	No	No	200 - 400	50	Yes
			29020+00	42	GV14	623914	4205293	2	Construction/Camp	Yes	No	400 - 500	50	Yes
							Wells Total	4						
Garden Valley														
Garden Valley	GV3	GV3	30192+00	36	GV1	637928	4220099	2	Construction	No	No	300	50	Yes
			30350+00	1	GV2	633584	4217796	1	Siding	No	Yes	400 - 500	1	Yes
			30518+00	36	GV3	629575	4214668	2	Construction	No	No	500	50	Yes
			30850+00	20	GV4	623343	4206849	1	Camp	Yes	No	400 - 500	50	Yes
							Wells Total	6						
Garden Valley														
Garden Valley	GV8	GV8	56380+00	1	GV15	642149	4210359	1	Siding	No	Yes	400 - 500	1	Yes
			56750+00	22	GV16	632200	4206258	1	Construction	No	No	200 - 400	50	Yes
			57025+00	42	GV17	623545	4205120	2	Construction/Camp	Yes	No	400 - 500	50	Yes
							Wells Total	4						

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Penoyer Valley 170														
Penoyer Valley														
Penoyer Valley	CS2	CS2	6468+00	75	PeV1	615488	4200730	2	Construction	No	No	500	30 - 50	Yes
					PeV8	614674	4197641	2	Construction	No	No	500	30 - 50	No
			6570+00	75	PeV2	614621	4200602	2	Construction	No	No	500	30 - 50	Yes
					PeV9	613444	4200334	2	Construction	No	No	500	30 - 50	Yes
			6745+00	76	PeV3	609910	4199491	2	Construction	No	No	500	30 - 50	Yes
					PeV4	609041	4199137	2	Construction/Siding	No	Yes	500	30 - 50	Yes
			6860+00	75	PeV10	607154	4198412	2	Construction - alt	No	No	500	50	Yes
					PeV5	606276	4198015	2	Construction	No	No	500	30 - 50	Yes
			6998+00	75	PeV6	603218	4195455	2	Construction	No	No	500	30 - 50	Yes
			7340+00	75	PeV11	601946	4188446	2	Construction - alt	No	No	500	50	No
					PeV7	597671	4189977	2	Construction	No	No	500	30 - 50	Yes
							Wells Total	22						
Railroad Valley South 173A														
Railroad Valley South														
Railroad Valley South	SR2/SR3a \ SR3 \ SR2/SR3b	SR3	7670+00	20	RrV1	588568	4183239	2	Camp	Yes	No	300 - 400	10	Yes
			8042+00	174	RrV2	580198	4179996	2	Construction	No	No	500 - 750	50	No
					RrV3	579482	4181082	1	Construction	No	No	500 - 750	50	No
					RrV4	578236	4180285	2	Construction	No	No	500 - 750	50	Yes
			8398+00	174	RrV5	568835	4184779	2	Construction	No	No	400 - 500	50	Yes
					RrV6	568834	4185414	2	Construction	No	No	400 - 500	50	Yes
					RrV7	568437	4187678	2	Construction	No	No	400 - 500	50	Yes
							Wells Total	13						

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Railroad Valley South														
Railroad Valley South	SR2/SR3a \ SR2 \ SR2/SR3b	SR3a	7670+00	20	RrV24	588568	4183239	2	Camp	Yes	No	300 - 400	10	Yes
			8042+00	92	RrV21	578236	4180285	2	Construction/Siding	No	Yes	500 - 750	50	Yes
					RrV22	580197	4180061	2	Construction	No	No	500 - 750	50	No
					RrV23	579477	4181116	1	Construction	No	No	500 - 750	50	No
		SR2	36085+00	188	RrV11	574110	4180579	2	Construction	No	No	400 - 500	50	Yes
					RrV12	574254	4180420	2	Construction	No	No	400 - 500	50	Yes
			36110+00	188	RrV13	572332	4182617	2	Construction	No	No	400 - 500	50	Yes
					RrV14	572485	4182541	2	Construction	No	No	400 - 500	50	Yes
			36250+00	188	RrV15	569553	4184196	2	Construction	No	No	400 - 500	50	Yes
					RrV16	569496	4184355	2	Construction	No	No	400 - 500	50	Yes
			36280+00	188	RrV17	568975	4185041	2	Construction	No	No	400 - 500	50	Yes
					RrV18	569071	4184838	2	Construction	No	No	400 - 500	50	Yes
			36405+00	188	RrV19	567900	4189168	2	Construction	No	No	400 - 500	50	Yes
					RrV20	567955	4189054	2	Construction	No	No	400 - 500	50	Yes
		SR3b	8550+00	45	RrV25	567804	4189317	1	Construction	No	No	400 - 500	50	Yes
								Wells Total	28					
Railroad Valley South														
Railroad Valley South		Quarry	Quarry NN-9B	24	RrV8	569750	4187796	1	Quarry	No	No	300 - 400	50	No
			Quarry NN-9A	24	RrV10	571026	4183199	1	Quarry	No	No	400 - 500	50	No
								Wells Total	2					
Hot Creek Valley 156														
Hot Creek Valley														
Hot Creek Valley	SR2/SR3 \ CS3	SR3	9225+00	38	HC2	558929	4207822	2	Construction	No	No	500	50	Yes
			9588+00	39	HC4	556445	4218088	2	Construction/Siding	No	Yes	500	50	Yes
					HC5	556218	4220049	2	Construction - alt	No	No	500	50	Yes
			9761+00	38	HC7	554501	4222472	2	Construction	No	No	500	50	Yes
								Wells Total	8					
Hot Creek Valley														
Hot Creek Valley		Quarry	Quarry NN-8D	44	HC1	559304	4205712	2	Construction Camp/Quarry	Yes	No	500	50	Yes
			Quarry NN-8C	24	HC3	558230	4211057	2	Construction/Quarry	No	No	500	20	Yes
			Quarry NN-8B	24	HC6	555900	4220187	2	Quarry	No	No	500	20	Yes
								Wells Total	6					

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Stone Cabin Valley 149														
Stone Cabin Valley														
Stone Cabin Valley	CS3	CS3	10497+00	61	SCV2	536738	4213285	2	Construction	No	No	200	50	Yes
			10667+00	61	SCV3	533744	4209311	2	Construction/Siding	No	Yes	200	50	Yes
			10755+00	20	SCV4	532271	4207376	2	Camp	Yes	No	200	10	Yes
			11452+00	61	SCV5	516640	4194186	2	Construction	No	No	200	50	Yes
							Wells Total	8						
Stone Cabin Valley														
Stone Cabin Valley		Quarry	Quarry NN-8A	34	SCV6	545970	4222064	2	Quarry	No	No	500	20	Yes
							Wells Total	2						
Ralston Valley 141														
Ralston Valley														
Ralston Valley	CS3 \ GF1/GF3a \ GF3	CS3	MOW 11740	1	RaV1	507309	4195005	1	Permanent Facility	Yes	Yes	300-400	1	Yes
			12078+00	64	RaV2	496909	4196806	2	Construction/Camp/Siding	Yes	Yes	500	100	Yes
		GF3	52222+00	43	RaV3	488311	4190027	2	Construction	No	No	500	50	Yes
			52396+00	43	RaV4	489070	4185051	2	Construction	No	No	500	50	Yes
							Wells Total	7						
Ralston Valley														
Ralston Valley	CS3 \ GF1/GF3a \ GF1	CS3	MOW 11740	1	RaV5	507309	4195005	1	Permanent Facility	Yes	Yes	300-400	1	Yes
		CS3/GF1	12078+00	126	RaV5	496909	4196806	2	Construction/Camp/Siding	Yes	Yes	500	100	Yes
							Wells Total	3						
Ralston Valley														
Ralston Valley	CS3/GF4	CS3	MOW 11740	1	RaV13	507309	4195005	1	Permanent Facility	Yes	Yes	300-400	1	Yes
		CS3/GF4	12078+00	126	RaV12	496909	4196806	2	Construction/Camp/Siding	Yes	Yes	500	100	Yes
							Wells Total	3						
Ralston Valley														
Ralston Valley		Quarry	Quarry NS-3B	24	RaV9	490330	4181481	2	Quarry	No	No	400 - 500	20	No
			Quarry NS-3A	24	RaV10	489663	4185444	2	Quarry	No	No	400 - 500	20	No
			Quarry NS-3A	24	RaV11	489873	4185380	2	Quarry - alt	No	No	400 - 500	20	No
							Wells Total	6						

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Alkali Spring Valley 142														
Alkali Spring Valley														
Alkali Spring Valley	GF1	GF1	12805+00	9	ASV1	481577	4188329	1	Construction	No	No	200 - 300	50	No
			12989+00	9	ASV2	481587	4188339	1	Construction	No	No	200 - 300	50	No
							Wells Total	2						
Alkali Spring Valley														
Alkali Spring Valley	GF4	GF4	42395+00	12	ASV3	481577	4188329	1	Construction	No	No	200 - 300	50	No
			42825+00	36	ASV4	478375	4180252	2	Construction/Quarry	No	No	200 - 300	50	No
							Wells Total	3						
Alkali Spring Valley														
Alkali Spring Valley		Quarry	Quarry ES-7	24	ASV6	475699	4175737	2	Quarry/Siding	No	Yes	100 - 200	10 - 30	No
					ASV7	478375	4180252	2	Quarry/Siding - alt	No	Yes	200 - 300	10 - 30	No
							Wells Total	4						
Stonewall Flat 145														
Stonewall Flat														
Stonewall Flat	GF3 \ GF1/GF3b	GF1	13590+00	160	StF4	488755	4164116	2	Construction	No	No	600 - 700	30 - 50	Yes
					StF6	488964	4164550	2	Construction	No	No	600 - 700	30 - 50	Yes
					StF8	489138	4164924	2	Construction - alt	No	No	600 - 700	30 - 50	Yes
							Wells Total	6						
Stonewall Flat														
Stonewall Flat	GF1 \ GF1/GF3b	GF1 red	13295+00	107	StF1	491448	4166671	2	Construction	No	No	600 - 700	30 - 50	No
					StF2	491575	4166557	2	Construction	No	No	600 - 700	30 - 50	No
					StF3	491292	4166763	2	Construction	No	No	600 - 700	30 - 50	No
		GF1 blue	13590+00	147	StF5	488755	4164116	2	Construction	No	No	600 - 700	30 - 50	Yes
					StF7	488964	4164550	2	Construction	No	No	600 - 700	30 - 50	Yes
					StF9	489138	4164924	2	Construction - alt	No	No	600 - 700	30 - 50	Yes
							Wells Total	12						

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Lida Valley 144														
Lida Valley														
Lida Valley	GF1/CS4/BC3	GF1	13775	20	LV1	487849	4159139	1	Camp	Yes	No	400 - 500	20	Yes
		BC3	14360+00	40	LV8	489558	4141757	2	Construction	No	No	250 - 400	30	Yes
			14440+00	41	LV10	489394	4140987	2	Construction/Siding	No	Yes	250 - 400	30	Yes
							Wells Total	5						
Lida Valley														
Lida Valley	GF4/CS4/BC3	GF4	43195+00	6	LV12	483445	4160790	1	Construction	No	No	400 - 500	20	No
			43290+00	6	LV14	483445	4160790	1	Construction	No	No	400 - 500	20	No
			43455+00	6	LV16	488074	4161234	1	Construction	No	No	400 - 500	20	Yes
		BC3	14360+00	40	LV31	489558	4141757	2	Construction	No	No	250 - 400	30	Yes
			14440+00	41	LV20	489394	4140987	2	Construction/Siding	No	Yes	250 - 400	30	Yes
		CS4	13775+00	20	LV3	487849	4159139	1	Camp	Yes	No	400 - 500	20	Yes
			13985+00	25	LV4	485421	4153605	1	Construction	No	No	250 - 400	20	Yes
			14172+00	25	LV29	485821	4148595	1	Construction	No	No	250 - 400	20	Yes
							Wells Total	10						
Lida Valley														
Lida Valley	GF1/BC2/CS4	GF1	13775	20	LV19	488047	4159710	1	Camp	Yes	No	400 - 500	20	Yes
		BC2	44120+00	19	LV24	489824	4143687	1	Construction/Siding	No	Yes	250 - 400	20	Yes
		CS4	13775+00	20	LV26	487849	4159139	1	Camp	Yes	No	400 - 500	20	Yes
			13985+00	25	LV28	485421	4153605	1	Construction	No	No	250 - 400	20	Yes
			14172+00	25	LV30	485821	4148595	1	Construction	No	No	250 - 400	20	Yes
							Wells Total	5						
Lida Valley														
Lida Valley	GF4 \ CS4 \ BC2	GF4	43195+00	6	LV21	483445	4160790	1	Construction	No	No	400 - 500	20	No
			43290+00	6	LV22	483445	4160790	1	Construction	No	No	400 - 500	20	No
			43455+00	6	LV23	488074	4161234	1	Construction	No	No	400 - 500	20	Yes
		BC2	44120+00	19	LV18	489824	4143687	1	Construction/Siding	No	Yes	250 - 400	20	Yes
		CS4	13775+00	20	LV25	487849	4159139	1	Camp	Yes	No	400 - 500	20	Yes
			13985+00	25	LV27	485421	4153605	1	Construction	No	No	250 - 400	20	Yes
			14172+00	25	LV6	485821	4148595	1	Construction	No	No	250 - 400	20	Yes
							Wells Total	7						

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Sarcobatus Flat 146														
Sarcobatus Flat														
Sarcobatus Flat	BC3/CS5	BC3	14658+00	70	SaF1	490496	4134574	2	Construction	No	No	200 - 300	50	Yes
		CS5	14900+00	70	SaF2	496884	4130666	2	Construction	No	No	200 - 300	50	Yes
			15176+00	70	SaF3	504392	4116690	1	Construction	No	No	200 - 300	50	Yes
					SaF14	500769	4124390	1	Construction	No	No	200 - 300	50	Yes
				20	SaF4	501235	4122943	1	Camp	Yes	No	200 - 300	20	Yes
			15510+00	71	SaF7	510929	4111827	2	Construction/Siding	No	Yes	200 - 300	50	Yes
			15975+00	70	SaF10	517972	4107196	2	Construction	No	No	200 - 300	50	Yes
							Wells Total	11						
Sarcobatus Flat														
Sarcobatus Flat	BC2/CS5	BC2	44343+00	13	SaF11	494423	4138557	1	Construction	No	No	200 - 500	30	Yes
			44502+00	13	SaF12	495680	4135337	1	Construction	No	No	200 - 500	30	Yes
			44825+00	13	SaF13	498744	4127309	1	Construction	No	No	200 - 500	30	Yes
			15268+00	45	SaF5	501235	4122943	1	Construction /Camp	Yes	No	200 - 300	50	Yes
			15470+00	25	SaF6	504404	4116698	1	Construction	No	No	200 - 300	50	Yes
			15700+00	26	SaF8	510929	4111827	1	Construction/Siding	No	Yes	200 - 300	50	Yes
			15975+00	25	SaF9	517972	4107196	1	Construction	No	No	200 - 300	50	Yes
							Wells Total	7						
Oasis Valley 228														
Oasis Valley														
Oasis Valley	OV1/CS6/BW1	OV1	16112+00	108	OV3	519934	4103531	2	Construction	No	No	150 - 300	50	Yes
					OV4	519618	4103896	1	Construction	No	No	150 - 300	50	Yes
			16342+00	108	OV5	525958	4100322	2	Construction	No	No	50 - 100	50	Yes
					OV6	525804	4100494	1	Construction	No	No	50 - 100	50	Yes
			16410+00	20	OV7	526281	4099198	2	Camp	Yes	No	50 - 150	20	Yes
		BW1	16682+00	108	OV11	525462	4089511	2	Construction - alt	No	No	100 - 150	50	No
					OV13	530063	4090885	2	Construction	No	No	1000 - 2000	50	Yes
					OV9	525823	4089501	2	Construction - alt	No	No	100 - 150	50	No
			16755+00	108	OV15	525736	4087971	2	Construction - alt	No	No	200 - 250	50	No
					OV17	530251	4089112	1	Construction	No	No	1000 - 2000	50	No
							Wells Total	17						

PROPOSED WELL SITES BY BASIN AND ROUTE (USGS ALIGNMENT)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	UTM East (meters)	UTM North (meters)	Number of Wells per Site	Well Type	Potable	Permanent	Proposed Well Depth (feet-bgs)	Estimated Available Production Rate per Well(gpm)	Within 1000 ft CRC ROW
Oasis Valley														
Oasis Valley	OV1/OV3/BW1	OV1	16112+00	60	OV1	519618	4103896	1	Construction	No	No	150 - 300	50	Yes
				60	OV2	519922	4103518	2	Construction	No	No	150 - 300	50	Yes
		OV3	46025+00	101	OV19	523459	4102742	2	Construction	No	No	150 - 300	20	Yes
					OV20	522976	4102855	2	Construction	No	No	150 - 300	20	Yes
					OV21	523601	4102704	2	Construction	No	No	150 - 300	20	Yes
			46075+00	101	OV22	525490	4102734	2	Construction	No	No	150 - 300	20	Yes
					OV23	525398	4102691	2	Construction	No	No	150 - 300	20	Yes
					OV24	525290	4102666	2	Construction	No	No	150 - 300	20	Yes
			46185+00	101	OV25	528166	4103079	2	Construction	No	No	50 - 150	30 - 50	Yes
					OV26	528118	4103265	2	Construction	No	No	50 - 150	30 - 50	Yes
			46315+00	121	OV27	527640	4099224	2	Construction	No	No	50 - 150	30 - 50	Yes
					OV28	527395	4099303	2	Construction /Camp	Yes	No	50 - 150	30 - 50	Yes
		BW1	16682+00	132	OV10	525803	4089501	2	Construction - alt	No	No	100 - 150	30-50	No
					OV12	525482	4089512	2	Construction - alt	No	No	100 - 150	30-50	No
					OV14	530081	4090900	2	Construction	No	No	500 - 2,000?	20	Yes
			16755+00	132	OV16	525714	4087971	2	Construction - alt	No	No	200 - 250	50	No
					OV18	530251	4089112	1	Construction	No	No	500 - 2,000?	50	No
							Wells Total	32						
Crater Flat 229														
Crater Flat														
Crater Flat	CS7	CS7	17118+00	128	CF1	537650	4082236	2	Construction	No	No	1500 - 2000	50	Yes
					CF2	537754	4082012	2	Construction/Siding	No	Yes	1500 - 2000	50	Yes
			17345+00	127	CF3	540087	4074959	2	Construction	No	No	1500 - 2000	50	Yes
					CF4	539891	4074969	2	Construction	No	No	1500 - 2000	50	Yes
			17510+00	127	CF5	543981	4072120	2	Construction	No	No	1500 - 2000	50	Yes
					CF6	543856	4071928	2	Construction	No	No	1500 - 2000	50	Yes
			17610+00	127	CF7	545982	4069846	2	Construction	No	No	1300 - 2000	50	Yes
					CF8	546210	4069836	2	Construction	No	No	1300 - 2000	50	Yes
							Wells Total	16						



Well Siting Explanations (USGS Alignment)

Appendix D

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Clover Valley 204						
Clover Valley						
Clover Valley	CAL	CAL				No Wells
Clover Valley						
Clover Valley	ECC	ECC	20040+00	1	CIV1	Site is to provide potable water for Facility - NRP FAC UP INT ECC. Well site is in alluvium.
			20090+00	98	CIV2	This Demand Location is within a relatively narrow valley (1/4 to 1/2 mile wide) that contains valley fill material. This Demand Location is near the toe of an alluvial/colluvial fan. The thickness of the unconsolidated material is unknown. The targeted aquifer is fractured/faulted Tertiary volcanics underlying the valley fill. Numerous fracture traces are evident in the adjacent, exposed mountain sides. The valley itself is likely fault controlled. If the valley fill material is found to be >100 feet, then overburden wells should be considered. The presence of Clover Creek suggests the depth to water in the valley is relatively shallow and that there is a large quantity of water in storage within the valley fill. Possible conflict with existing users.
					CIV3	This Demand Location is within a relatively narrow valley (1/4 to 1/2 mile wide) that contains valley fill material. This Demand Location is near the toe of an alluvial/colluvial fan. The thickness of the unconsolidated material is unknown. The targeted aquifer is fractured/faulted Tertiary volcanics underlying the valley fill. Numerous fracture traces are evident in the adjacent, exposed mountain sides. The valley itself is likely fault controlled. If the valley fill material is found to be >100 feet, then overburden wells should be considered. The presence of Clover Creek suggests the depth to water in the valley is relatively shallow and that there is a large quantity of water in storage within the valley fill. Possible conflict with existing users.
Clover Valley						
Clover Valley		Quarry	Quarry CA-12	24	CIV4	Target is shallow groundwater in alluvium.
			Quarry CA-11	24	CIV5	Alternate well site along large northeast fracture trace in volcanics.
Panaca Valley 203						
Panaca Valley						
Panaca Valley	ECC/CS1	ECC	20330+00	71	PanV1	Potential depth to GW = 75 - 100', several domestic wells within 2 miles of the site, should avoid drilling in mapped sedimentary rocks to the east of CRC, potential for impact to existing wells, off CRC and near visible road from high-res orthophotos.
					PanV2	Potential depth to GW = 75 - 100', several domestic wells within 2 miles of the site, should avoid drilling in mapped sedimentary rocks to the east of CRC, potential for impact to existing wells, dual use well for work camp
			20465+00	71	PanV3	Potential depth to GW = 50 - 75', several irrigation wells within 2 miles of the site, yield appears to decrease and depth to GW appears to increase with distance from Meadow Valley Wash area, should avoid drilling in mapped sedimentary rocks to the west of CRC, potential for impact to existing wells.
			20545+00	20	PanV4	Depth to water 25 to 50 feet estimated well depth 75 - 100 feet, domestic work camp demand only (20 gpm)
		CS1	1610+00	71	PanV5	Potential depth to GW = 40 - 60', several irrigation wells within 1.5 miles of the site producing well over 1,000 gpm, tuffaceous rocks present and generally logged at 120 to 160 feet (bgs), potential for impact to existing wells.
			1775+00	71	PanV6	Potential depth to GW = 50 - 100'. Few wells are nearby with little information. Closest well yields 150 gpm and is completed to 100'. Location is situated in unconsolidated alluvial deposits adjacent to tuffaceous sedimentary rocks. Known spring located 1.7 miles northwest of demand point.
			2099+00	71	PanV7	Potential depth to GW = 50 - 100'. This site should be drilled first before drilling near the actual demand location at Bennett Pass in carbonate rocks (no information available), drill near Sta 2000+00 approx. 3,700 feet west of Bennett Springs in alluvial sediments
					PanV9	Unknown depth to groundwater, intersect N-S trending faults in consolidated limestone/dolomite carbonates, drill if point a) is not feasible as proposed

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Panaca Valley						
Panaca Valley	CAL/CS1	CAL	1042+00	2	PanV10	Depth to water is 10 to 25 feet, domestic demand only (2 gpm) for NRP_FAC_CAL_woutFMFø
			1200+00	12	PanV11	Domestic demand only for railroad, shallow groundwater conditions.
					PanV12	Domestic demand only for railroad, shallow groundwater conditions.
		CS1	1442+00	7	PanV13	Depth to water is 50 to 100' with anticipated yield > 200 gpm. Wells are sited in Meadow Valley Wash alluvial deposits
			1600+00	95	PanV14	Potential depth to GW = 40 - 60'. Several irrigation wells lie within 1.5 miles of the site producing well over 1,000 gpm. Tuffaceous rocks are present and generally logged at 120 to 160 feet (bgs). Potential exists for impact to existing wells.
Panaca Valley	CAL/CS1	CS1	1700+00	95	PanV15	Potential depth to GW = 150 to 250'. Site is situated on mapped sedimentary tuffaceous rock near alluvial contact. Alluvial sediments appear to be productive where saturated based on wells less than 1 mile away. A well completed in alluvial fill to bedrock at 300' was reported as dry (less than 2 miles to the north).
			1700+00	95	PanV16	Potential depth to GW = 150 to 250'. Site is situated on mapped sedimentary tuffaceous rock near alluvial contact. Alluvial sediments appear to be productive where saturated based on wells less than 1 mile away. A well completed in alluvial fill to bedrock at 300' was reported as dry (less than 2 miles to the north). Elevation on ROW is approximately 100' higher than the site of the ROW.
					PanV17	Potential depth to GW = 50 - 100'. Few wells are nearby with little information. Closest well yields 150 gpm and is completed to 100'. Site location is situated in unconsolidated alluvial deposits adjacent to tuffaceous sedimentary rocks, known spring located 1.7 miles northwest of demand point.
Panaca Valley		Quarry				
Panaca Valley		Quarry	Quarry CA-8A	24	PanV20	Site designed to meet quarry demand only. Nearby are municipal wells that yield 200 to 900 gpm. These are completed in alluvial fill to total depth at potential andesite and quartzite bedrock formation at approximately 200' depth.
			Quarry CA-8B	24	PanV23	Site designed to meet quarry demand only and is situated within mapped Andesite geologic unit, 0.6 miles east of proposed plant site (along existing trails) and 0.2 miles west of a USGS well that is reported as artesian. Estimated depth to water 50 to 250 feet (based USGS on topography).
Dry Lake Valley 181						
Dry Lake Valley	CS1					
Dry Lake Valley	CS1	CS1	2285+00	90	DLV1	Potential depth to GW = 750'. Little information is available in this area Site is at consolidated volcanic and carbonate rock contact. An appopriated spring lies nearby.
					DLV2	Potential depth to GW = 750'. Little information is available in this area Site is at consolidated volcanic and carbonate rock contact. An appopriated spring lies nearby.
			2385+00	90	DLV3	Potential depth to GW = 500 to 700'. Little information is available in this area. Site is situated within mapped alluvial material between carbonate rocks to the NE and SW of site and aligned with mapped N-S trending fault to the north in mapped carbonate (limestone/dolomite) rock.
					DLV4	Potential depth to GW = 400 to 600'. Little information is available in this area. Site is situated within mapped alluvial material between carbonate rocks to the NE and SW of site and aligned with mapped N-S trending fault to the north in mapped carbonate (limestone/dolomite) rock.
			2805+00	90	DLV5	Potential depth to GW = 150 - 250'. There is evidence of water at surface near edge of ROW. MX wells completed 13 miles south adjacent to the same Dry Lake fault structure were tested at 500 gpm. Hydrogeologic conditions are highly variable with another well in same area being tested at 15 gpm. Site well adjacent to Dry Lake fault on minor roads.
			2885+00	115	DLV6	Potential depth to GW = 200 - 300'. MX wells completed 13 miles south adjacent to the East Dry Lake fault structure were tested at 500 gpm while a well completed 13 miles south between west and east fault structure was dry to 832'. Well should be drilled only if inadequate yield provided by all other nearby sites. Carbonate aquifer well 5.5 miles to northwest has water at 678 feet depth.
					DLV7	Potential depth to GW = 200 - 300'. MX wells completed 13 miles south adjacent to the East Dry Lake fault structure were tested at 500 gpm. Highly variable hydrogeologic conditions with another well in same area being tested at 15 gpm. Site well adjacent to West Dry Lake fault to serve as multi-purpose well for construction and permanent demand at rail siding located and Rattlesnake Rd construction camp. Site well near Sta 3020+00. Carbonate aquifer well 3 miles to northwest has water at 678 feet depth.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Pahroc Valley 208						
Pahroc Valley						
Pahroc Valley	CS1 \ WR1/WR3	CS1	3512+00	182	DLV10	Site 1 well in ROW in Dry Lake Valley, located approx. 1 to 1.5 miles south of Deadman and Coal and Hamilton Springs and approx. 0.5 norths north of Black Rock Spring, location situated in geologic formation mapped as welded and non-welded ash flow tuff but may be underlain by regional carbonates, which appear to be the source for nearby springs, potential for impact to existing springs and surface water appropriations in the area should be noted. Note point of diversion is in different basin than point of use. Carbonate aquifer well 3 miles to east has water at 678 feet depth.
					DLV8	Site 1 well in Dry Lake Valley off ROW near existing mapped Black Rock Spring and related geologic features on minor road. Depth to water is unknown. Distance from ROW along road = 0.51 miles. Location is situated in welded and non-welded ash flow tuff but may be underlain by regional carbonates, which appear to be the source for nearby springs. Potential for impact to existing springs and surface water appropriations in the area. Note point of diversion is in different basin than point of use. Carbonate aquifer well 3 miles to east has water at 678 feet depth.
					DLV9	Site 1 well in Dry Lake Valley off ROW near existing mapped Black Rock Spring and related geologic features on minor road. Depth to water is unknown. Distance from ROW along road = 0.63 miles. Location is situated in welded and non-welded ash flow tuff but may be underlain by regional carbonates, which appear to be the source for nearby springs. Potential for impact to existing springs and surface water appropriations in the area. Note point of diversion is in different basin than point of use. Carbonate aquifer well 3 miles to east has water at 678 feet depth.
					PahV1	Site 1 well in ROW. Depth to groundwater is approximately 500 to 800'. There may be as much as 500-feet of low permeability volcanic rock that may be underlain by limestone sequence that is part of the regional carbonate aquifer.
			3642+00	182	PahV2	Site 1 well, located 6,300 ft from of ROW in alluvial sediments. Approximate depth to groundwater = 500 to 700'.
					PahV3	Site 1 well, no existing trails or minor roads, approx. 1 mile east of Route 318. Depth to groundwater may be 400 to 600 feet. This is sited in mapped alluvial sediments that may not be saturated in this area. The well would likely have to penetrate regional carbonate rock formations for groundwater occurrence.
Pahroc Valley	CS1 \ WR1/WR3	CS1	3642+00	182	PahV4	Site 2 wells in area of no existing trails or minor roads. Site is located approximately 1 mile east of Route 318. Depth to groundwater may be 400 to 600 feet. Sited near N-S extension of White River Fault system at mountain block contact between Quaternary alluvial fill and consolidated rocks that appear to be related to regional carbonate rocks.
					PahV5	
Pahroc Valley	CS1 \ WR1/WR3	WR1	3822+00	182	PahV6	
					PahV7	
					PahV8	Site is 2 miles west of ROW at Mountain block on a minor road. The target is the carbonate aquifer.
			4280+00	183	PahV10	
					PahV11	
					PahV9	
			4501+00	182	PahV12	
					PahV13	
					PahV14	
White River Valley 207						
White River Valley						
White River Valley	WR1/WR3	WR1	4734	20	WRV1	Site 1 well based on average demand of 20 gpm for domestic use only. Depth to water is 60 to 160 feet. This well should be drilled after higher demand construction wells to determine appropriate depth, estimated well depth 200 to 300'.
			4795+00	137	WRV2	
					WRV3	

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Coal Valley 171						
Coal Valley						
Coal Valley	WR1/WR3 \ WR3	WR1	5110+00	63	CoV1	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Groundwater at this location is relatively deep (>250 feet).
					CoV2	
			5320+00	63	CoV3	This Demand Station is located near the valley margin, and the valley fill deposits will be relatively thin and unsaturated. Therefore, the main targeted aquifer will be the underlying Paleozoic carbonates. To minimize the amount of surface casing, the selected well locations should be located as close to the valley margin as possible.
					CoV4	
Coal Valley						
Coal Valley	WR1/WR3 \ WR3 \ GV2	WR1	5110+00	125	CoV1	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet).
					CoV5	
		GV2	28110+00	7	CoV6	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet). Well site is in valley fill.
			28275+00	7	CoV7	
			28340+00	7	CoV8	
Coal Valley						
Coal Valley	WR1/WR3 \ WR3 \ GV8	WR1	5110+00	125	CoV9	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet).
					CoV10	
		GV8	GV8-A	7	CoV11	This Demand Location is located in the middle of the valley and, as such, the aquifer will be valley fill deposits. Paleozoic carbonates are located at depth, but drilling to them is unnecessary. Depth to groundwater at this location is relatively deep (>250 feet). Well site is in valley fill.
			GV8-B	7	CoV12	
			GV8-C	7	CoV13	
Garden Valley 172						
Garden Valley						
Garden Valley	GV1	GV1	5600+00	7	GV6	Retain well for siding. Site is in valley fill.
			5850+00	7	GV7	Site is in valley fill.
			6050+00	7	GV8	site on roadway adjacent to CRC in valley fill
Garden Valley	GV1	GV1	6215+00	20	GV9	Site is in valley fill.
			6300+00	7	GV10	Site is in valley fill.
Garden Valley						
Garden Valley	GV2	GV2	28400+00	1	GV11	Well is at siding on GV2 alternative route. Well site is in valley fill.
			28752+00	22	GV13	Site located on road at CRC margin. Site is in valley fill.
			29020+00	42	GV14	Well is for construction camp and construction. Site is in valley fill.
Garden Valley						
Garden Valley	GV3	GV3	30192+00	36	GV1	This Demand Location is located in the northern portion of Garden valley, and the targeted aquifer will be valley fill deposits. The reports indicate that perched conditions exist further to the north in the valley and depth to groundwater should be relatively shallower than at the other demand station. Typical well depths in this area range from 200-300 feet deep.
Garden Valley	GV3	GV3	30350+00	1	GV2	Well is at siding. Site is in valley fill.
			30518+00	36	GV3	This Demand Location is located further to the southwest and closer to the valley margin than the other demand location. The targeted aquifer would be valley fill deposits. Depth to groundwater at this location will likely be deeper than at the other demand location in this valley.
			30850+00	20	GV4	Well is for construction camp. Site is in valley fill.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Garden Valley						
Garden Valley	GV8	GV8	GV8-D	1	GV15	Well is at siding on GV8 alternative route. Well site is in valley fill.
			GV8-E	22	GV16	Site is in valley fill.
			GV8-F	42	GV17	Well is for construction camp and construction. Site is in valley fill.
Penoyer Valley 170						
Penoyer Valley						
Penoyer Valley	CS2	CS2	6468+00	75	PeV1	Demand location is in andesite bedrock. Surface water right located on upslope side of ROW at demand location. Better apparent well locations are in alluvium at faults 1700 m to west. Locate wells in alluvium on downslope side of ROW at intersections with faults.
					PeV8	Demand location is in alluvium 900 m from alluvium/bedrock contact. There are no nearby wells or water rights. This area shows a pinnacle of welded andesite bedrock in middle of cut in range with faults either side of the pinnacle.
			6570+00	75	PeV2	Demand location is in alluvium 900 m from alluvium/bedrock contact. There are no nearby wells or water rights. This area shows a pinnacle of welded andesite bedrock in middle of cut in range with faults either side of the pinnacle.
					PeV9	Demand location is in alluvium 900 m from alluvium/bedrock contact. There are no nearby wells or water rights. This area shows a pinnacle of welded andesite bedrock in middle of cut in range with faults either side of the pinnacle.
			6745+00	76	PeV3	Demand location is in alluvium 400 m from alluvium/bedrock contact. No nearby wells or water rights. Locate wells at dry washes 600 m east and 600 m west of demand location on downslope side of ROW.
					PeV4	Demand location is in alluvium 400 m from alluvium/bedrock contact. No nearby wells or water rights. Locate wells at dry washes 600 m east and 600 m west of demand location on downslope side of ROW. Save one well for siding.
			6860+00	75	PeV10	Demand location is in alluvium 1200 m from alluvium/bedrock contact. No nearby wells or water rights. Locate wells at dry washes 900 m east and at demand location on downslope side of ROW.
					PeV5	Demand location is in alluvium 1200 m from alluvium/bedrock contact. No nearby wells or water rights. Locate wells at dry washes 900 m east and at demand location on downslope side of ROW.
			6998+00	75	PeV6	Demand location is in alluvium near two tuff pinnacles. A dry wash runs past the nose of the southern pinnacle. No nearby wells or water rights. Locate wells in dry washes between the two tuff pinnacles on downslope side of ROW.
			7340+00	75	PeV11	Demand location is in tuff, edge of alluv. is 700 m. to east. No nearby wells or water rights. Locate wells in outwash fan to east of demand location on downslope side of ROW.
					PeV7	Demand location is in tuff, edge of alluv. is 700 m. to east. No nearby wells or water rights. Locate wells in outwash fan to east of demand location on downslope side of ROW.
Railroad Valley South 173A						
Railroad Valley South						
Railroad Valley South	SR2/SR3a \ SR3 \ SR2/SR3b	SR3	7670+00	20	RrV1	Construction camp well. Site is in valley fill.
			8042+00	174	RrV2	Demand location is at gap in ranges. No nearby wells or water rights. Local faulting may be significant, some reported seismicity. Locate wells in dry washes & faults on existing roadways to east on north side of ROW.
					RrV3	Demand location is at gap in ranges. No nearby wells or water rights. Local faulting may be significant, some reported seismicity. Locate wells in dry washes & faults on existing roadways to east on north side of ROW.
Railroad Valley South	SR2/SR3a \ SR3 \ SR2/SR3b	SR3	8042+00	174	RrV4	Demand location is at gap in ranges. No nearby wells or water rights. Local faulting may be significant, some reported seismicity. Locate wells in dry washes & faults on existing roadways to east on north side of ROW.
			8398+00	174	RrV5	Demand location is at gap in ranges, near Reveille fault zone. No nearby wells or water rights. Locate wells in dry washes @ on east (downslope) side of ROW.
					RrV6	Demand location is at gap in ranges, near Reveille fault zone. No nearby wells or water rights. Locate wells in dry washes @ on east (downslope) side of ROW.
					RrV7	Demand location is at gap in ranges, near Reveille fault zone. No nearby wells or water rights. Locate wells in dry washes @ on east (downslope) side of ROW.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Railroad Valley South						
Railroad Valley South	SR2/SR3a \ SR2 \ SR2/SR3b	SR3a	7670+00	20	RrV24	construction camp well. Site is in valley fill.
			8042+00	92	RrV21	Demand location is at gap in ranges. No nearby wells or water rights. Local faulting may be significant. Some reported seismicity. Locate wells in dry washes & faults on existing roadways to east on north side of ROW.
					RrV22	
					RrV23	
Railroad Valley South	SR2/SR3a \ SR2 \ SR2/SR3b	SR2	36085+00	188	RrV11	Site located in valley fill.
					RrV12	Site located in valley fill.
			36110+00	188	RrV13	Site located in valley fill at toe of alluvial fan.
					RrV14	Site located in valley fill at toe of alluvial fan.
			36250+00	188	RrV15	Site in alluvial channel between two large volcanic hills. Its unclear whether the volcanics are older rocks extending through alluvium or interbedded with it.
					RrV16	Site in alluvial channel between two large volcanic hills. Its unclear whether the volcanics are older rocks extending through alluvium or interbedded with it.
			36280+00	188	RrV17	Site located in valley fill.
					RrV18	Site located in valley fill.
			36405+00	188	RrV19	Site located in valley fill.
					RrV20	Site located in valley fill.
		SR3b	Not specified	45	RrV25	Well to meet construction demand for northern part of SR3 segment. Specific demand point not specified.
Railroad Valley South						
Railroad Valley South		Quarry	Quarry NN-9B	24	RrV8	Site located in valley fill.
			Quarry NN-9A	24	RrV10	Site in alluvial channel between two large volcanic hills. Its unclear whether the volcanics are older rocks extending through alluvium or interbedded with it.
Hot Creek Valley 156						
Hot Creek Valley						
Hot Creek Valley	SR2/SR3 \ CS3	SR3	9225+00	38	HC2	Demand location is on toe of alluvial fan. Some local wells and water rights, low apparent potential for conflicts. Locate wells a) downslope side of ROW at Reveille Fault Zone or b) In dry washes on downslope side of ROW.
			9588+00	39	HC4	Demand location is at head of alluvial fan. One nearby water right - low apparent potential for conflict due to low demand. Locate wells a) In dry washes on downslope side of ROW or b) At dry washes on downslope side of ROW at mouth of Cow Canyon. Use one well for siding.
					HC5	
			9761+00	38	HC7	Site is in valley fill.
Hot Creek Valley						
Hot Creek Valley		Quarry	Quarry NN-8D	44	HC1	Site is in valley fill.
			Quarry NN-8C	24	HC3	Site is in valley fill.
			Quarry NN-8B	24	HC6	Site is in valley fill.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Stone Cabin Valley 149						
Stone Cabin Valley						
Stone Cabin Valley	CS3	CS3	10497+00	61	SCV2	Demand location is midway between valley center dry wash and edge of alluvium. No nearby wells or water rights. Locate wells at dry washes on downslope side of ROW.
			10667+00	61	SCV3	Demand location is midway between valley center dry wash and edge of alluvium. Large canyon to SE, better quantity water in alluvium (?). Locate wells at dry washes on downslope side of ROW. Retain 1 well for siding.
			10755+00	20	SCV4	Well site in valley fill.
			11452+00	61	SCV5	Demand location is in flat alluvial area w/ braided dry washes. Multiple irrigation wells to east and northeast, potential water conflicts. Locate wells on south side of ROW.
Stone Cabin Valley						
Stone Cabin Valley		Quarry	Quarry NN-8A	34	SCV6	
Ralston Valley 141						
Ralston Valley						
Ralston Valley	CS3 \ GF1/GF3a \ GF3	CS3	MOW 11740	1	RaV1	Install one permanent well to provide 200kgal/year (.4 gpm) for MOW
			12078+00	64	RaV2	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm. Locate wells on downslope side of ROW. Also supply siding and construction camp.
		GF3	52222+00	43	RaV3	Demand location is in alluvium btw andesite/basalt pinnacles ~ 1700m from playa. No nearby wells or water rights. Locate wells @ dry washes @ margin of ROW.
			52396+00	43	RaV4	Demand location is in tuffaceous sedimentary bedrock setting. No nearby wells or water rights. Locate wells @ convenience locations in tuff near contact w/ andesite/basalt.
Ralston Valley						
Ralston Valley	CS3 \ GF1/GF3a \ GF1	CS3	MOW 11740	1	RaV13	Install one permanent well to provide 200kgal/year (.4 gpm) for MOW
		CS3/GF1	12078+00	126	RaV12	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm. Locate wells on downslope side of ROW. Also supply siding and construction camp and construction water for GV4 segment.
Ralston Valley						
Ralston Valley	CS3/GF4	CS3	MOW 11740	1	RaV6	Install one permanent well to provide 200kgal/year (.4 gpm) for MOW
		CS3/GF4	12078+00	126	RaV5	Demand location is flat alluvium near playa. Some nearby water rights, possible conflicts. Wells may yield 100 gpm. Locate wells on downslope side of ROW. Also supply siding and construction camp and construction water for GV4 segment.
Ralston Valley						
Ralston Valley		Quarry	Quarry NS-3B	24	RaV9	Wells in volcanic rocks - high risk for no water.
			Quarry NS-3A	24	RaV10	Wells in volcanic rocks - high risk for no water.
			Quarry NS-3A	24	RaV11	Wells in volcanic rocks - high risk Alternate site for Quarry NS-3A.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Alkali Spring Valley 142						
Alkali Spring Valley						
Alkali Spring Valley	GF1	GF1	12805+00	9	ASV1	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
Alkali Spring Valley			12989+00	9	ASV2	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
Alkali Spring Valley						
Alkali Spring Valley	GF4	GF4	42395+00	12	ASV3	Well site located in valley fill on an alluvial fan. Wells may be capable of significantly higher production than estimated 50 gpm.
Alkali Spring Valley			42825+00	36	ASV4	Supply quarry and demand point 42825
Alkali Spring Valley						
Alkali Spring Valley		Quarry	Quarry ES-7	24	ASV6	Site located along NE striking fault zone in upper part of alluvial fan. Target is water in underlying fractured volcanics.
					ASV7	Alternate well location located on alluvial fan adjacent to US 95. Save one well for siding.
Stonewall Flat 145						
Stonewall Flat						
Stonewall Flat	GF3 \ GF1/GF3b	GF1	13590+00	160	Stf4	Tertiary tuffaceous volcanic rocks crop out as two hills one approximately 3,600 feet to the west of the CRC centerline at this location; the other approximately 4,000 feet northwest of the CRC centerline. An alluvium filled channel extends north-northwest of the site between the two hills. Alluvium will be deeper in this area than east or west of this location. Several north-northeast striking faults have been mapped cutting these two hills and could serve to transmit groundwater to the alluvium in this area. Siting a well at station 13620+00 positioned towards the east edge of the CRC (488884mE, 4164049mN) will put the well within the area of this channel. This area should have alluvium extending to a greater depth than the adjacent area.
					Stf6	This area should have alluvium extending to a greater depth than the adjacent area.
					Stf8	Possible alternative location to intersect deeper alluvium filled channel.
Stonewall Flat						
Stonewall Flat	GF1 \ GF1/GF3b	GF1 red	13295+00	107	Stf1	Site along road in valley fill southeast of CRC.
					Stf2	Site along road in valley fill southeast of CRC.
					Stf3	Site along road in valley fill southeast of CRC.
Stonewall Flat		GF1 blue	13590+00	147	Stf5	Tertiary tuffaceous volcanic rocks crop out as two hills one approximately 3,600 feet to the west of the CRC centerline at this location; the other approximately 4,000 feet northwest of the CRC centerline. An alluvium filled channel extends north-northwest of the site between the two hills. Alluvium will be deeper in this area than east or west of this location. Several north-northeast striking faults have been mapped cutting these two hills and could serve to transmit groundwater to the alluvium in this area. Siting a well at station 13620+00 positioned towards the east edge of the CRC (488884mE, 4164049mN) will put the well within the area of this channel. This area should have alluvium extending to a greater depth than the adjacent area.
					Stf7	This area should have alluvium extending to a greater depth than the adjacent area.
					Stf9	Possible alternative location to intersect deeper alluvium filled channel.
Lida Valley 144						
Lida Valley						
Lida Valley	GF1	GF1	13775	20	LV1	This would be a construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
Lida Valley	GF1/CS4/BC3	BC3	14360+00	40	LV8	A few small stock wells lie near the CRC in the Lida Valley Basin but no aquifer test data is available. All of these produce water from valley fill. Two locations for wells in the valley fill are suggested to meet the demand at 14360+00, 14440+00 and the rail siding 14450 to 14500. These are located on an existing road at the east edge of the CRC and at station 14440+00 just west of the corridor centerline. The nearest well lies 3.7 miles to the northwest. It has a collar elevation of 4634 feet and a water depth of 288 feet. It lies about 6,000 feet from the center of the Alkali Flat playa. Site 14360 lies at an elevation of 4575 feet on the margin of the playa. Generally groundwater depths are less at the playa than upslope on the basin sides. Therefore it's likely that groundwater at site 14360 may be at less than 288 feet depth. Site 14400 lies 2,500 feet farther from the playa than site 14360, but at a similar elevation. Groundwater at this site is probably between 200 and 350 feet. Recommended drilling depths for these two wells are 250 to 400 feet. At least one well at site 14400 should be constructed as a potable water well for long term usage.
			14440+00	41	LV10	A few small stock wells lie near the CRC in the Lida Valley Basin but no aquifer test data is available. All of these produce water from valley fill. Save one well for siding.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Lida Valley						
Lida Valley	GF4/CS4/BC3	GF4	43195+00	6	LV12	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
			43290+00	6	LV14	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
			43455+00	6	LV16	No access to demand point. Well site located on road at 43560+00 in alluvium. No data on water depth.
		BC3	14360+00	40	LV31	A few small stock wells lie near the CRC in the Lida Valley Basin but no aquifer test data is available. All of these produce water from valley fill. Two locations for wells in the valley fill are suggested to meet the demand at 14360+00, 14440+00 and the rail siding 14450 to 14500. These are located on an existing road at the east edge of the CRC and at station 14440+00 just west of the corridor centerline. The nearest well lies 3.7 miles to the northwest. It has a collar elevation of 4634 feet and a water depth of 288 feet. It lies about 6,000 feet from the center of the Alkali Flat playa. Site 14360 lies at an
			14440+00	41	LV20	A few small stock wells lie near the CRC in the Lida Valley Basin but no aquifer test data is available. All of these produce water from valley fill. Save one well for siding.
Lida Valley	GF4/CS4/BC3	CS4	13775+00	20	LV3	This would be a construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
			13985+00	25	LV4	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
			14172+00	25	LV29	Site is in valley fill.
Lida Valley						
Lida Valley	GF1/BC2/CS4	GF1	13775	20	LV19	This would be a construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
		BC2	44120+00	19	LV24	Well site at siding on alternate BC2 in valley fill. Use for construction water for unspecified demand point.
		CS4	13775+00	20	LV26	This would be a construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
			13985+00	25	LV28	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
			14172+00	25	LV30	Site is in valley fill.
Lida Valley						
Lida Valley	GF4 \ CS4 \ BC2	GF4	43195+00	6	LV12	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
			43290+00	6	LV14	Demand point is poor site for wells. Locate off CRC in valley fill to south. No data on water depth.
			43455+00	6	LV16	No access to demand point. Well site located on road at 43560+00 in alluvium. No data on water depth.
		BC2	44120+00	19	LV18	Well site at siding on alternate BC2 in valley fill. Use for construction water for unspecified demand point.
		CS4	13775+00	20	LV3	This would be a construction camp well. Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
			13985+00	25	LV4	Site is in valley fill adjacent to volcanic rock outcrop. Numerous north-northeast striking bedrock faults are in this area.
			14172+00	25	LV6	Site is in valley fill.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Sarcobatus Flat 146						
Sarcobatus Flat						
Sarcobatus Flat	BC3/CS5	BC3	14658+00	70	SaF1	Generally in the Sarcobatus Flat Basin groundwater will be encountered at one or more zones within the alluvial materials. Partial confinement of water-bearing zones is common in alluvial basins in Nevada so that actual depths to producing zones may be more than this. In addition, it is advisable to intersect multiple water producing zones so that a large thickness of aquifer is exposed to the well screen. This increases the probability that wells will have a higher productive capacity. In general useable quantities of water may be expected in the valley fill along much of the CRC within Sarcobatus Flat basin as long as its not in an area close to bedrock exposures where the alluvium is too thin to permit a reasonable saturated thickness above bedrock.
			14900+00	70	SaF2	The proposed site should be placed near the southern edge of the CRC in order to ensure an adequate thickness of saturated valley fill for productive wells. Groundwater should be encountered at this location in valley fill between 100 and 200 feet based on wells near Scotty's Junction, the nearest of which is 4.4 miles to the southeast of the proposed site. Production capacity in excess of 200 gpm per well is possible.
		CS5	15176+00	70	SaF3	Demand location 15510+00 lies in an area of valley fill very close to volcanic rock outcrop. A well at this site has a low probability for success since it would be sited in volcanic rock. A better location for water to supply this demand location is at station 15430. This site lies on Highway 95 at the edge of a large alluvial fan that extends from the mountains on the east. A former highway construction well located approximately 1 mile to the northwest on this alluvial fan had a static water level depth of 85 feet and was completed at a total depth of 200 feet. The proposed site is at a similar elevation so groundwater should be encountered at a depth of 100 to 150 feet with a total well depth of 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
					SaF14	Site is in valley fill.
			15510+00	71	SaF4	Supply construction camp only
					SaF7	The proposed site should be placed near the southwestern edge of the CRC adjacent to US 95. Groundwater should be encountered at this location in valley fill between 40 and 100 feet based the nearest 2 wells that are 1.6 miles and 2.5 miles to the southeast of the proposed site and at a similar elevation. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible. Retain 1 well to supply siding.
Sarcobatus Flat	BC3/CS5	CS5	15975+00	70	SaF10	The proposed site should be placed near the northern edge of the CRC in order to avoid intersecting bedrock (exposed approximately 1,500 feet southwest of station 15975+00) at depth before traversing a significant saturated thickness of valley fill. Groundwater should be encountered at this location in valley fill between 50 and 150 feet based the nearest well which lies 1,000 feet to the east of the proposed site and at a similar elevation. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
Sarcobatus Flat						
Sarcobatus Flat	BC2/CS5	BC2	44343+00	13	SaF11	Proposed site is in valley fill. No data available on groundwater depth.
			44502+00	13	SaF12	Proposed site in valley fill. No data on groundwater depth.
			44825+00	13	SaF13	Site wells on road near station 44837 at edge of CRC. No data on groundwater depth.
			15268+00	45	SaF5	Supply construction camp as well as demand point.
			15470+00	25	SaF6	Demand location 15470+00 lies in an area of valley fill very close to volcanic rock outcrop. A well at this site has a low probability for success since it would be sited in volcanic rock. A better location for water to supply this demand location is at station 15430. This site lies on Highway 95 at the edge of a large alluvial fan that extends from the mountains on the east. A former highway construction well located approximately 1 mile to the northwest on this alluvial fan had a static water level depth of 85 feet and was completed at a total depth of 200 feet. The proposed site is at a similar elevation so groundwater should be encountered at a depth of 100 to 150 feet with a total well depth of 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
			15700+00	26	SaF8	The proposed site should be placed near the southwestern edge of the CRC adjacent to US 95. Groundwater should be encountered at this location in valley fill between 40 and 100 feet based the nearest 2 wells that are 1.6 miles and 2.5 miles to the southeast of the proposed site and at a similar elevation. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
			15975+00	25	SaF9	The proposed site should be placed near the northern edge of the CRC in order to avoid intersecting bedrock (exposed approximately 1,500 feet southwest of station 15975+00) at depth before traversing a significant saturated thickness of valley fill. Groundwater should be encountered at this location in valley fill between 50 and 150 feet based the nearest well which lies 1,000 feet to the east of the proposed site and at a similar elevation. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Oasis Valley 228						
Oasis Valley						
Oasis Valley	OV1/CS6/BW1	OV1	16112+00	108	OV3	The proposed sites should be placed near the southwestern edge of the CRC in order to ensure an adequate thickness of saturated valley fill for productive wells. Groundwater should be encountered at this location in valley fill between 30 and 150 feet based on two existing wells one of which is 2.3 miles to the south of the proposed site, the other 2.5 miles north-northwest of the proposed site. Drilling depths to permit intersection of reliable production should be 150 to 300 feet. Production capacity in excess of 50 gpm per well is highly probable.
					OV4	
			16342+00	108	OV5	The proposed sites should be placed near the eastern edge of the CRC in order to avoid a large wetland area caused by springs. Groundwater should be encountered at this location in valley fill between 10 and 50 feet based on three existing wells, 1,200 feet to the south-southwest, 1,900 feet to the south-southeast, and 1,900 feet to the east of the proposed site. Groundwater is very shallow here caused by a fault zone that dams southwestward flowing groundwater in underlying volcanic rocks from Pahute Mesa area. Drilling depths to ensure intersection of reliable production should be 50 to 100 feet. Production capacity in excess of 50 gpm per well is highly probable based on typical characteristics of valley fill alluvial aquifers in the area. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use.
					OV6	
			16410+00	20	OV7	Construction camp. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use. High potential for conflict with existing water users.
Oasis Valley	OV1/CS6/BW1	BW1	16682+00	108	OV11	No aquifer test data has been found for existing wells in volcanic rocks near the CRC. Wells in the area are monitoring wells to the north and east of the CRC and only shallow alluvial wells lie to the west of the CRC. Historically much of the groundwater used in the Oasis Valley basin has come from springs and shallow dug wells in the alluvium. The largest production wells in the basin are a part of the Beatty Water and Sanitation system where individual wells yield from 80 to 275 gpm from alluvium in the Bullfrog Hills. - This demand location is situated in an area underlain by Tertiary volcanic rocks. The area surrounding these locations is devoid of any wells so that there is no specific data to evaluate the potential for viable wells in this area on the CRC. - Two sites (a and b) lie in an area of valley fill on an existing roadway 3 miles west-southwest of demand location 16682+00. Groundwater lies at a depth of approximate 20 to 30 feet. Drilling depths should be between 100 and 150 feet. Production capacity in excess of 30 gpm per well is possible based on typical characteristics of valley fill alluvial aquifers in the area. Typically water in this area contains elevated levels of fluoride making it
					OV13	No aquifer test data has been found for existing wells in volcanic rocks near the CRC. Wells in the area are monitoring wells to the north and east of the CRC and only shallow alluvial wells lie to the west of the CRC. Historically much of the groundwater used in the Oasis Valley basin has come from springs and shallow dug wells in the alluvium. The largest production wells in the basin are a part of the Beatty Water and Sanitation system where individual wells yield from 80 to 275 gpm from alluvium in the Bullfrog Hills. - This demand location is situated in an area underlain by Tertiary volcanic rocks. The area surrounding these locations is devoid of any wells so that there is no specific data to evaluate the potential for viable wells in this area on the CRC. 2 wells in volcanics no data to specify wells. Possible water production from intersecting faulted areas in the volcanics. It is designed to intersect a low angle west-dipping detachment fault (possibly water-bearing) whose trace passes through station 16755. High risk to produce significant water.
Oasis Valley	OV1/CS6/BW1	BW1	16682+00	108	OV9	No aquifer test data has been found for existing wells in volcanic rocks near the CRC. The largest production wells in the basin are a part of the Beatty Water and Sanitation system where individual wells yield from 80 to 275 gpm from alluvium in the Bullfrog Hills. -This demand location is situated in an area underlain by Tertiary volcanic rocks. The area surrounding these locations is devoid of any wells so that there is no specific data to evaluate the potential for viable wells in this area on the CRC. -Two sites (a and b) lie in an area of valley fill on an existing roadway 3 miles west-southwest of demand location 16682+00. Groundwater lies at a depth of approximate 20 to 30 feet. Drilling depths should be between 100 and 150 feet. Production capacity in excess of 30 gpm per well is possible based on typical characteristics of valley fill alluvial aquifers in the area. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use. Drilling depths to ensure intersection of reliable production should be 200 to 300 feet. Production capacity in excess of 200 gpm per well is possible.
					OV15	No aquifer test data has been found for existing wells in volcanic rocks near the CRC. Wells in the area are monitoring wells to the north and east of the CRC and only shallow alluvial wells lie to the west of the CRC. Historically much of the groundwater used in the Oasis Valley basin has come from springs and shallow dug wells in the alluvium. The largest production wells in the basin are a part of the Beatty Water and Sanitation system where individual wells yield from 80 to 275 gpm from alluvium in the Bullfrog Hills. This lies in an area of valley fill on an existing roadway (3.3 miles west-southwest of demand location 16755+00). This is in an area of shallow groundwater as indicated by a two wells, one 2,900 feet to the southwest, the other 2,800 feet to the northwest. A log for one of the wells indicates the aquifer consists of sand and gravel. Groundwater lies at a depth of approximate 100 to 150 feet. Drilling depths should be between 200 and 250 feet. Production capacity in excess of 50 gpm per well is highly probable based on typical characteristics of valley fill alluvial aquifers in the area. Two wells are planned for the alluvium area.
			16755+00	108	OV17	No aquifer test data has been found for existing wells in volcanic rocks near the CRC. Wells in the area are monitoring wells to the north and east of the CRC and only shallow alluvial wells lie to the west of the CRC. Historically much of the groundwater used in the Oasis Valley basin has come from springs and shallow dug wells in the alluvium. The largest production wells in the basin are a part of the Beatty Water and Sanitation system where individual wells yield from 80 to 275 gpm from alluvium in the Bullfrog Hills. 1 well in volcanics no data to specify wells. This site is in volcanic rocks approximately ½ mile west of the CRC at station 16755. It is designed to intersect a low angle west-dipping detachment fault (possibly water-bearing) whose trace passes through station 16755. High risk to produce significant water.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Oasis Valley						
Oasis Valley	OV1/OV3/BW1	OV1	16112+00	60	OV1	The proposed site should be placed near the southwestern edge of the CRC in order to ensure an adequate thickness of saturated valley fill for productive wells. Groundwater should be encountered at this location in valley fill between 30 and 150 feet based on two existing wells one of which is 2.3 miles to the south of the proposed site, the other 2.5 miles north-northwest of the proposed site. Drilling depths to permit intersection of reliable production should be 150 to 300 feet. Production capacity in excess of 50 gpm per well is highly probable.
				60	OV2	The proposed site should be placed near the southwestern edge of the CRC in order to ensure an adequate thickness of saturated valley fill for productive wells. Groundwater should be encountered at this location in valley fill between 30 and 150 feet based on two existing wells one of which is 2.3 miles to the south of the proposed site, the other 2.5 miles north-northwest of the proposed site. Drilling depths to permit intersection of reliable production should be 150 to 300 feet. Production capacity in excess of 50 gpm per well is highly probable.
		OV3	46025+00	101	OV19	Located on road on north side of CRC. Likely low yielding wells.
					OV20	
			46075+00	101	OV21	
					OV22	
			46185+00	101	OV23	Site wells in area of shallow groundwater in alluvium. High potential for adverse impacts to existing downgradient users. Site on road on north side of CRC.
					OV24	
			46315+00	121	OV25	Site wells in alluvial channel along existing road near margin of CRC
					OV26	
		BW1	16682+00	132	OV27	Two sites lie in an area of valley fill on an existing roadway 3 miles west-southwest of demand location 16682+00. This is in an area of shallow groundwater as indicated by a monitoring well 900 feet to the southwest. Groundwater lies at a depth of approximate 20 to 30 feet. Drilling depths should be between 100 and 150 feet. Production capacity in excess of 30 gpm per well is possible based on typical characteristics of valley fill alluvial aquifers in the area. The log for the nearby well indicates the aquifer consists of clayey gravel and sandy clay so yields may be impaired. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use.
					OV10	
Oasis Valley	OV1/OV3/BW1	BW1	16682+00	132	OV12	Two sites lie in an area of valley fill on an existing roadway 3 miles west-southwest of demand location 16682+00. This is in an area of shallow groundwater as indicated by a monitoring well 900 feet to the southwest. Groundwater lies at a depth of approximate 20 to 30 feet. Drilling depths should be between 100 and 150 feet. Production capacity in excess of 30 gpm per well is possible based on typical characteristics of valley fill alluvial aquifers in the area. The log for the nearby well indicates the aquifer consists of clayey gravel and sandy clay so yields may be impaired. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use.
					OV14	Two wells in volcanics no data to specify wells. Possible water production from intersecting faulted areas in the volcanics. It is designed to intersect a low angle west-dipping detachment fault (possibly water-bearing) whose trace passes through station 16755. High risk to produce significant water.
			16755+00	132	OV16	This lies in an area of valley fill on an existing roadway (3.3 miles west-southwest of demand location 16755+00). This is in an area of shallow groundwater as indicated by a two wells, one 2,900 feet to the southwest, the other 2,800 feet to the northwest. A log for one of the wells indicates the aquifer consists of sand and gravel. Groundwater lies at a depth of approximate 100 to 150 feet. Drilling depths should be between 200 and 250 feet. Production capacity in excess of 50 gpm per well is highly probable based on typical characteristics of valley fill alluvial aquifers in the area. Two wells are planned for the alluvium area. Typically water in this area contains elevated levels of fluoride making it unsuitable for potable water use.
					OV18	Site well in volcanics no data to specify wells. This site is in volcanic rocks approximately ½ mile west of the CRC at station 16755. It is designed to intersect a low angle west-dipping detachment fault (possibly water-bearing) whose trace passes through station 16755. High risk to produce significant water.

PROPOSED WELL SITES BY BASIN AND ROUTE - USGS ALIGNMENT
(Well Site Comments)

Basin/No.	Route	Segment	Demand Point Station	Required Demand Point Production Rate (gpm)	Site ID	Comments
Crater Flat 229						
Crater Flat						
Crater Flat	CS7	CS7	17118+00	128	CF1	Water supply for this demand location 17118+00 should be sited at the nearby rail siding site (17070+10 and 17120+90). Based on other wells in the basin the static water level at this site should be between 900 and 1,000 feet below surface with actual depths to water producing zones even greater. The nearest two production wells (Crater Flat 1 and PW-2) located 3 miles to the northwest extend to depths of 1,600 to 2,100 feet. Assuming that specific capacities of new wells are similar to well PW-2 then at least 200 feet of water column would be needed to supply a 50 gpm production rate.
					CF2	
			17345+00	127	CF3	These have been sited at station 17345+00 near the east and west edges of the CRC. Based on other wells in the basin the static water level at these sites should be between 800 and 1,000 feet below surface with actual depths to water producing zones even greater. The nearest two wells are located 1.7 miles southwest (well VH-2) and 2.0 miles south (well VH-1). The most productive water zone in VH-1 was at a depth of approximately 1,900 feet so well depths of 2,000 feet are suggested for this location. Pump test results on well VH-1 suggest that a production rate of 50 gpm is a reasonable expectation for wells at this site.
					CF4	
			17510+00	127	CF5	These have been sited at station 17510+00 near the northeast and southwest edges of the CRC. Based on other wells in the basin the static water level at these sites should be between 800 and 1,000 feet below surface with actual depths to water producing zones even greater. The nearest two wells are located 1.5 miles northeast (well WT-10) and 2.5 miles west (well VH-1). The most productive water zone in VH-1 was at a depth of approximately 1,900 feet so well depths of 2,000 feet are suggested for this location. Pump test results on well VH-1 suggest that a production rate of 50 gpm is a reasonable expectation for wells at this site.
					CF6	
			17610+00	127	CF7	These have been sited at station 17610+00 near the southwest and northeast edges of the CRC. Based on other wells in the basin the static water level at these sites should be between 800 and 1,000 feet below surface with actual depths to water producing zones even greater. The nearest two wells are located 2.1 miles north (well WT-11) and 1-mile northeast (well VH-10). Water levels in these wells suggest that the static water level at this site will be in the range of 900 to 1,100 feet. A minimum depth for these wells is 1,100 to 1,300 feet although it may be necessary to drill significant deeper to intersect a sufficiently productive fractured rock aquifer. Insufficient data is available to further define this depth.
					CF8	



Appendix E

Appendix E

Field Name	Data Type	Description of field
		needs to meet. such as potability and permanence. The set of valid types are: "Construction - Alt", "Construction", "Construction Camp", "Permanent Facility", "Quarry", "Siding", "Yard", and valid combinations there of such as "Construction plus Permanent Facility."
ProposedWell Depth_feetbgs	String	The proposed depth (in feet) of one or both of the Wells at this Well Site.
ReqDemandPt ProdRate_GPM	Number	The required production rate at this well site in gallons per minute (GPM) based on the calculated demand.
EstAvailProd RatePerWell _GPM	Number	The estimated production rate at this well site in gallons per minute (GPM) based on the calculated demand.
NumWells PerSite	Number	The number of wells per site, which will be 1 or 2.
Potable	String	"Yes" or "No" if the water at this Well Site is potable.
Permanent	String	"Yes" or "No" if this Well Site is permanent.
Within1000ft CRC_ROW	String	"Yes" or "No" if this Well Site is within the 500 foot right of way on each side of alignment.
X_UTM_NAD83 _ZN11_feet	Number	The easting or x coordinate of the center of this Well Site. Coordinates are in NAD_1983_UTM_Zone_11N feet.
Y_UTM_NAD83 _ZN11_feet	Number	The northing or y coordinate of the center of this Well Site. Coordinates are in NAD_1983_UTM_Zone_11N feet.
COMMENTS	String	Comments captured as the engineers located these wells sites. Comments were also captured during design meetings and meetings with the clients. Special notes about each well site are stored as comments. Also, if 2 Wells at a Well Site are not identical, it will be noted here.
Shape	Point	

Data Definitions for CRC Water Resources GIS Features

Feature Class: Wells_5ft_20060410.shp

Description: This feature class contains the point representation of proposed well sites for the Caliente Rail Corridor project. Each point represents the center of a 250' by 250' well site. Each record contains attribution about the well sites and wells at the site. There may be 1 or 2 wells per site, and they are assumed to be identical wells unless otherwise specified in the comments.

Purpose: To facilitate acquisition of water rights, drilling, and construction of wells for the construction, maintenance, and operation of the Caliente Rail Line.

Revision History:

Rev1 – Revision 1 includes modifications to the proposed well sites based on recent analysis conducted, which included a revised alignment based on 5-ft contour data (Rev.1 Alignment). The data was transformed into the NAD 83 UTM ZN 11 coordinate system.

Rev2 - Revision 2 includes modifications to the proposed well sites based on recent analysis conducted and review comments for Rev1 data.

Number of records: 216

Field Name	Data Type	Description of field
OBJECTID	String	Unique identifier for Wells Sites generated by the software. This identifier will act as a primary key.
SITEID	String	Project identifier for Wells Sites. This identifier will act as a primary key. The formula for the identifier sequence is (Basin Abbreviation plus a sequencing number.) Each feature has a unique primary key.
BASIN	String	The groundwater basin from which the well will draw water. The well location and required production were calculated on a per basin basis.
DemandPt Station	String	The original demand was reported as a station location. This is the approximate demand station which this Well Site will service.
Route	String	A path composed of alignment segments that completely traverse a groundwater basin. There is a unique route for every topologically viable path through each basin as there is a unique water demand calculation for that Route. Routes are named by concatenating the underlying segment names in the order of ascending station location.
WellType	String	The type of Well defines the water resource requirements the Well

Appendix E

Feature Class: oldAlignByBasinAlt_NAD83_REV1_20060217

Description: A linear segmentation of the Caliente rail alignment alternatives by basin. This feature class has overlapping segments, but represents a complete coverage of the possible route to enter and exit each basin at the boundary.

Purpose: To facilitate definition of the water demand and design of proposed well site location.

Revision History:

Rev1 – Revision 1 added a missing segment in Lida Valley. Meaningless fields were removed, and the data was transformed into the NAD 83 UTM ZN 11 coordinate system.

Number of records: 34

Field Name	Data Type	Description of field
ObjectID	Number	Project identifier for alignment alternatives by basin. This identifier will act as a primary key. Each feature has a unique primary key.
Route	String	A path composed of alignment segments that completely traverse a groundwater basin. There is a unique route for every topologically viable path through each basin as there is a unique water demand calculation for that Route. Routes are named by concatenating the underlying segment names in the order of ascending station location.
Shape_Length	Number	Length of feature in internal units which are feet.
Shape	Line	

Feature Class: ConstrCampLoc_NAD83_REV1_20060217

Description: The point location of the construction camps along the rail alignment. This data was originally generated by NRP and distributed to the water resources team. Additional points were added by the water resources team based on verbal instructions given during project meetings. Each point feature represents a location only, and there are no attributes.

Purpose: To facilitate mapping and water resource determination. This is not an official deliverable as part of the water resource work.

Revision History:

Appendix E

Rev1 – Revision 1 transformed data into the NAD 83 UTM ZN 11 coordinate system.

Number of records: 14

Field Name	Data Type	Description of field
ObjectID	Number	Project identifier for Construction Camps. This identifier will act as a primary key. Each feature has a unique primary key.
Shape	Point	

Feature Class: MissingYard_NAD83_REV1_20060217

Description: This point feature class represents the location of a missing yard. Other yards were passed to the water resources team by NRP. This point represents a single yard that was identified verbally in a project meeting. This is the location only, and there are no attributes.

Purpose: To facilitate mapping and water resource determination. This is not an official deliverable as part of the water resource work.

Revision History:

Rev1 – Revision 1 transformed data into the NAD 83 UTM ZN 11 coordinate system.

Number of records: 1

Field Name	Data Type	Description of field
ObjectID	Number	Project identifier for Missing Yards. This identifier will act as a primary key. Each feature has a unique primary key.
Shape	Point	

Feature Class: Sidings_NAD83_REV1_20060217

Description: The point location of the mid point of a siding as located from NRP plan and profile drawings. Some sidings were specified verbally during water resource meetings, and subsequently located in the GIS.

Purpose: To facilitate mapping and water resource determination. This is not an official deliverable as part of the water resource work.

Appendix E

Revision History:

Rev1 – Revision 1 transformed data into the NAD 83 UTM ZN 11 coordinate system.

Number of records: 17

Field Name	Data Type	Description of field
ObjectID	Number	Project identifier for Missing Yards. This identifier will act as a primary key. Each feature has a unique primary key.
BeginPt	Number	The station location of the beginning of the siding along the alignment in the direction of the stationing.
MidPt	Number	The station location of the midpoint of the siding along the alignment.
EndPt	Number	The station location of the ending of the siding along the alignment in the direction of the stationing.
Shape	Point	

Feature Class: WaterDemandPts_NAD83_REV1_20060217

Description: Water demand points derived from plan and profile drawings received from NRP. This feature class defines the water demand by locating water demand points along the alignment for each complete alternative per basin.

Purpose: To facilitate mapping and water resource determination. This is not an official deliverable as part of the water resource work.

Revision History:

Rev1 – Revision 1 transformed data into the NAD 83 UTM ZN 11 coordinate system.

Number of records: 103

Field Name	Data Type	Description of field
ObjectID	Number	Project identifier for Missing Yards. This identifier will act as a primary key. Each feature has a unique primary key.
Demand	Number	The quantity of water required at that point measured in millions of gallons.

Appendix E

Field Name	Data Type	Description of field
Descr	Text	A description of the demand if necessary or any pertinent notes. This field is mostly null.
Location	Text	The station location of the demand point.
Alternate_Segment	Text	This is the alternate to which the demand refers. This was done ad-hoc as our work was being done and before the route system was devised. This field is out of date, but does help define the demand by alternative and basin.
Shape	Point	

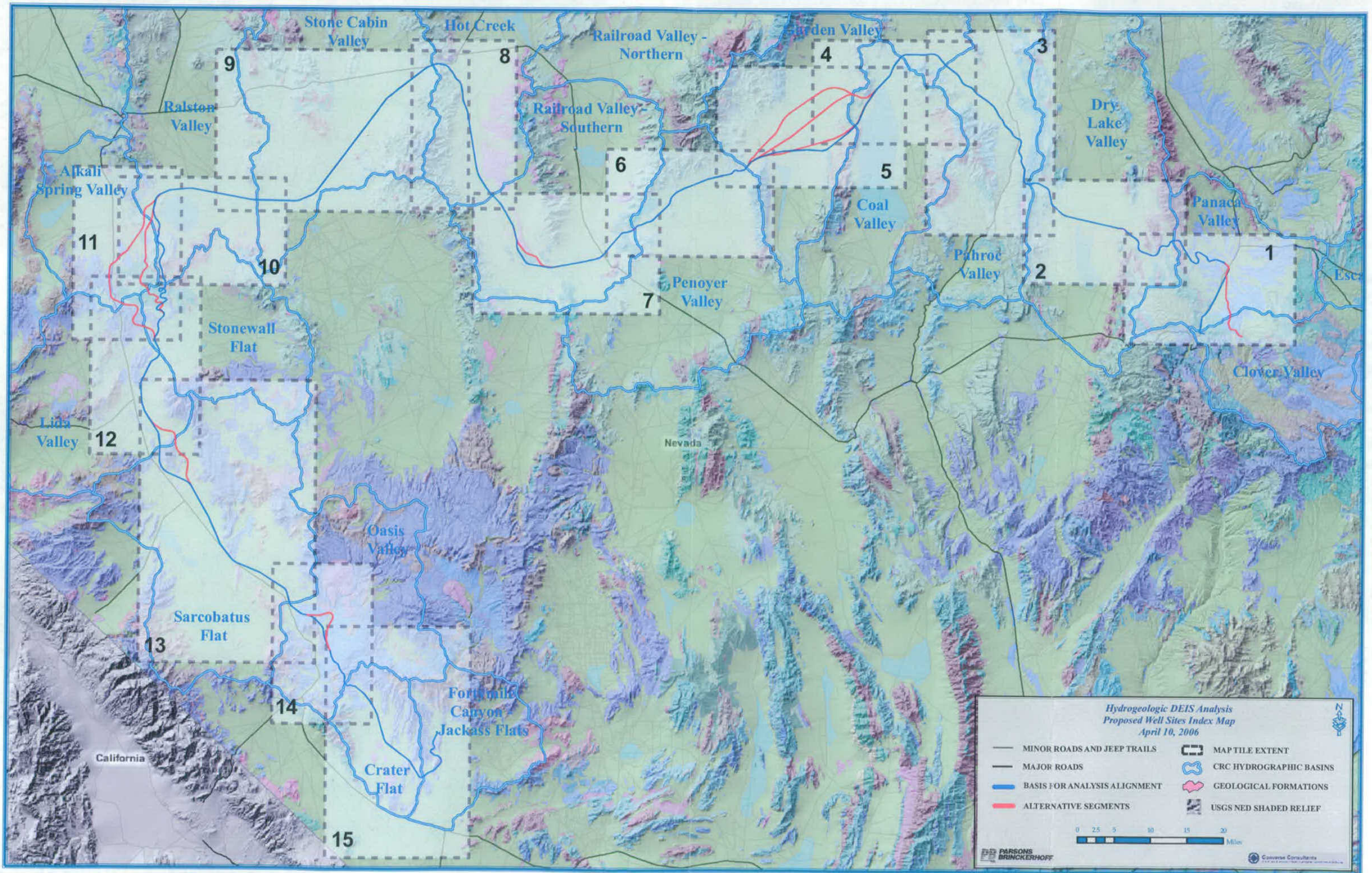
BASIN MAP GEOLOGY KEY*

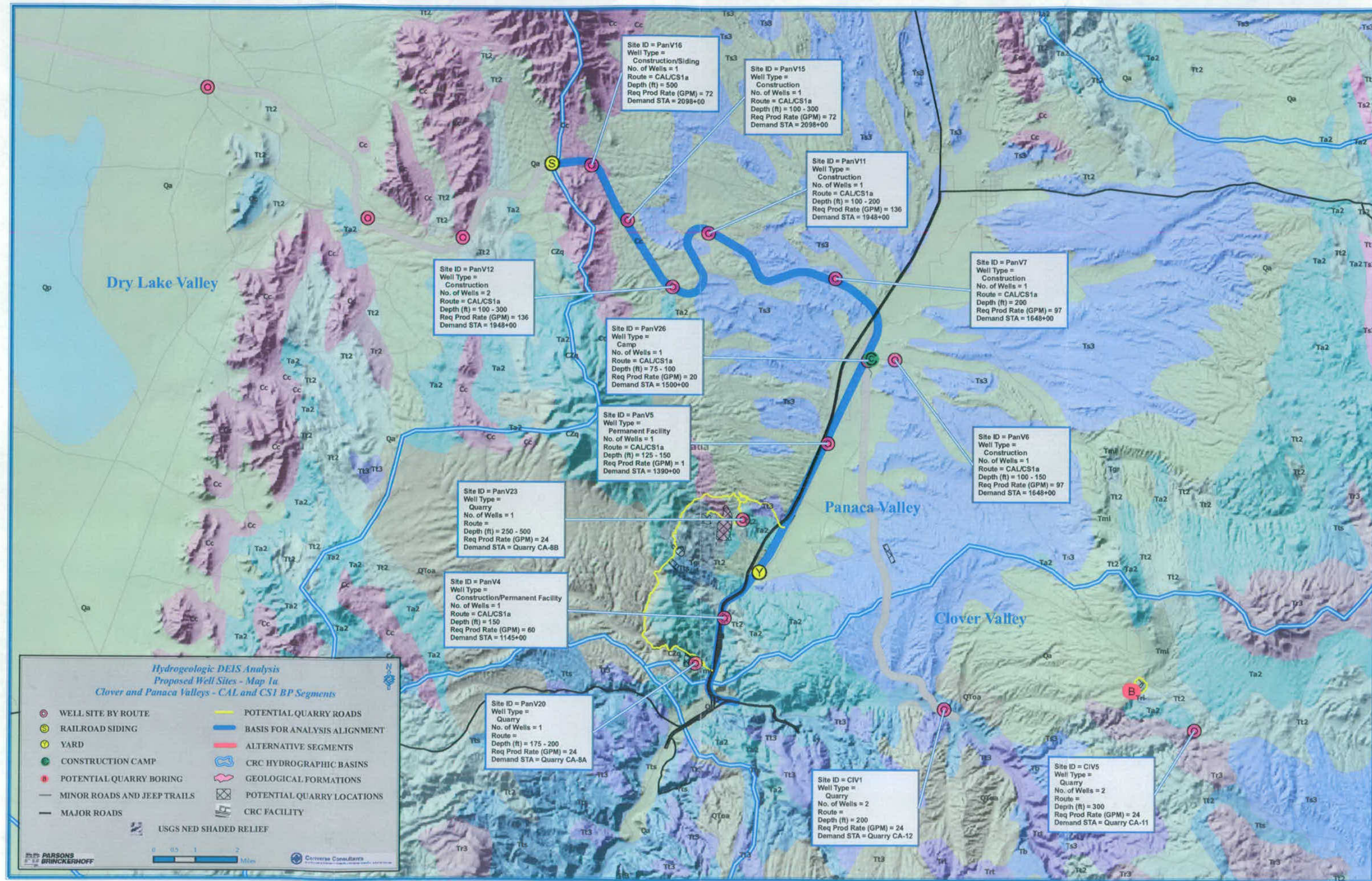
Formation Code	Formation ID	Formation Description
247	Cc	LIMESTONE AND DOLOMITE, LOCALLY THICK SEQUENCES OF SHALE AND SILTSTONE
116	Ch	HARMONY FORMATION (UPPER CAMBRIAN)
114	Csc	SCOTT CANYON FORMATION (MIDDLE CAMBRIAN)
108	Css	SANDSTONE AND QUARTZITE
170	Ct	SHALE AND THIN-BEDDED LIMESTONE, THINLY INTERBEDDED LIMESTONE AND CHERT
255	CZq	QUARTZITE AND MINOR AMOUNTS OF PHYLLITIC SILTSTONE, LIMESTONE, AND DOLOMITE
231	CZs	PHYLLITIC SILTSTONE, QUARTZITE, AND LESSER AMOUNTS OF LIMESTONE AND DOLOMIT
41	Dc	DOLOMITE, LIMESTONE, MINOR AMOUNTS OF SANDSTONE AND QUARTZITE
244	DCc	DOLOMITE AND LIMESTONE (LOWER PALEOZOIC)
242	DCsv	CHERT, SHALE, ARGILLITE, SILTSTONE, QUARTZITE, AND GREENSTONE
237	Ds	SHALE, SILICEOUS, SILTSTONE, CHERT, AND MINOR AMOUNTS OF LIMESTONE
216	Dsl	SLAVEN CHERT
71	Dt	ARGILLACEOUS LIMESTONE, CHERT, AND SHALE
76	Jd	DUNLAP FORMATION (LOWER AND MIDDLE JURASSIC)
99	Jgb	GABBROIC COMPLEX (LOWER AND MIDDLE JURASSIC)
180	Jgr	GRANITIC ROCKS
85	JPu	VOLCANOGENIC SEDIM. ROCKS, TUFF, ANDESITIC/FELSITIC FLOWS, CARBONATE ROCKS
251	JTRa	AZTEC SANDSTONE (TRIASSIC? AND JURASSIC)
77	JTrs	SHALE, MUDSTONE, SILTSTONE, SANDSTONE, CARBONATE ROCK, SPARSE VOLC. ROCK
145	JTrsv	SHALE, SANDSTONE, VOLCANOGENIC, CLASTIC ROCKS, ANDESITE, RHYOLITE
83	Jv	VOLCANIC SANDSTONE, FELSIC ASH-FLOW TUFFS, RHYOLITE, RHYODACITE FLOWS
249	Kgr	GRANITIC ROCKS
198	Kjd	DIORITE
165	KJim	IGNEOUS AND METAMORPHIC COMPLEX
141	Ks	CONTINENTAL DEPOSITS OF SILTSTONE, SHALE, CONGLOMERATE, AND LIMESTONE
43	Mc	LIMESTONE AND MINOR AMOUNTS OF DOLOMITE AND SHALE
222	MDmc	CONGLOMERATE, LIMESTONE, META-ANDESITE, PHYLLITE, AND SHALE
179	MDs	SHALE, SILTSTONE, SANDSTONE, CHERT-PEBBLE, CONGLOMERATE, LIMESTONE
239	MI	MASSIVE LIMESTONE
36	Msv	SILICEOUS AND VOLCANIC ROCKS
184	MZgr	GRANITIC ROCKS, WESTERN NEVADA (MESOZOIC)
212	Oc	LIMESTONE, DOLOMITE, SHALE, QUARTZITE
233	OCc	DOLOMITE AND LIMESTONE
253	OCt	PHYLLITE, SHALE, AND LIMESTONE
109	Os	SHALE, CHERT, MINOR AMOUNTS OF QUARTZITE, GREENSTONE, LIMESTONE
101	Osv	SILICEOUS AND VOLCANIC ROCKS
204	Ot	SHALE, CHERT, LIMESTONE
60	Pc	LIMESTONE
64	Pc+	CHERRY LIMESTONE AND SPARSE DOLOMITE, SHALE, SANDSTONE (LOW. AND UP. PERMIAN)
62	Pcd	LIMESTONE (CHERTY, SANDY, CHERT-PEBBLE CONGLOMERATE (LOW. AND MID. PENNSY.))
221	PMc	LIMESTONE, DOLOMITE, AND SHALE (UPPER PALEOZOIC)
39	PMh	HAVALLAH SEQUENCE OF SILBERLING AND ROBERTS (1962)
50	PPa	ANTLER SEQUENCE OF SILBERLING AND ROBERTS (1962)
235	PPc	LIMESTONE, SPARSE DOLOMITE, SILTSTONE, SANDSTONE (LOWER PENNSYLVANIAN TO PERMIAN)
238	PPcd	SANDY AND SILTY LIMESTONE, CONGLOMERATE, AND SILTSTONE (LOWER PENNSY. TO PERMIAN)
225	Psc	SILTSTONE, SANDSTONE, LIMESTONE, DOLOMITE (COMMONLY SILTY AND SANDY), GYPSUM
119	Pzsp	SERPENTINITE (PALEOZOIC)
131	Qa	ALLUVIAL DEPOSITS
122	Qls	LANDSLIDE DEPOSITS
120	Qm	MORAINAL DEPOSITS
129	Qp	PLAYA, MARSH, ALLUVIAL-FLAT DEPOSITS, LOCALLY ERODED
158	QTa	ANDESITE FLOWS AND BRECCIAS
175	QTb	BASALT FLOWS
9	QToa	OLDER ALLUVIAL DEPOSITS
176	Qtr	RHYOLITIC FLOWS AND SHALLOW INTRUSIVE ROCKS
254	QTS	SEDIMENTARY ROCKS (Mostly Lake Deposits)
248	Sc	DOLOMITE
236	Se	ELDER SANDSTONE
17	SOc	DOLOMITE
178	Ss	SHALE AND CHERT
13	Sl	PLATY LIMESTONE, LIMY SILTSTONE, CHERT AT BASE
160	Ta1	ANDESITE AND RELATED ROCKS OF INTERMEDIATE COMPOSITION

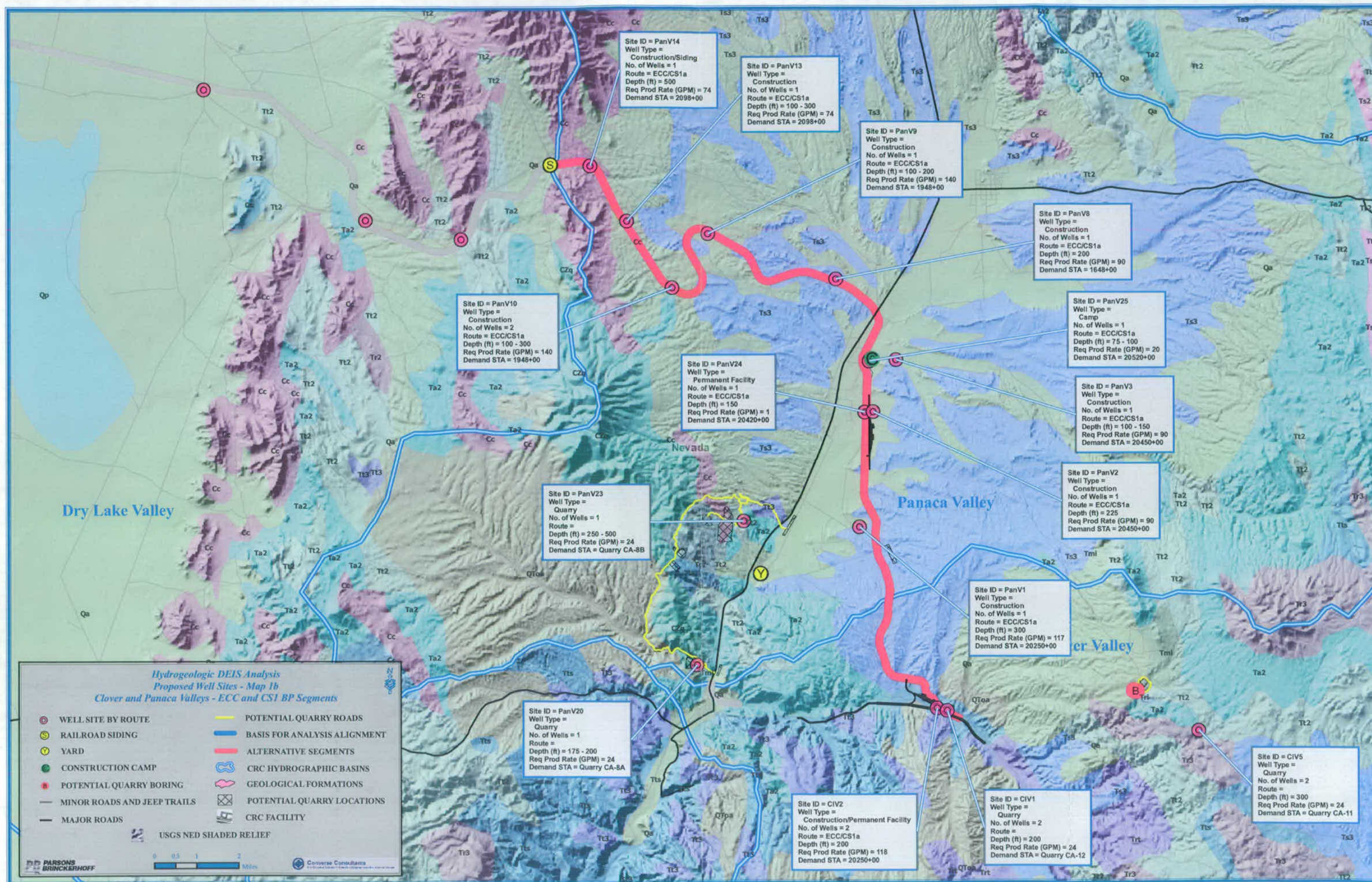
BASIN MAP GEOLOGY KEY*

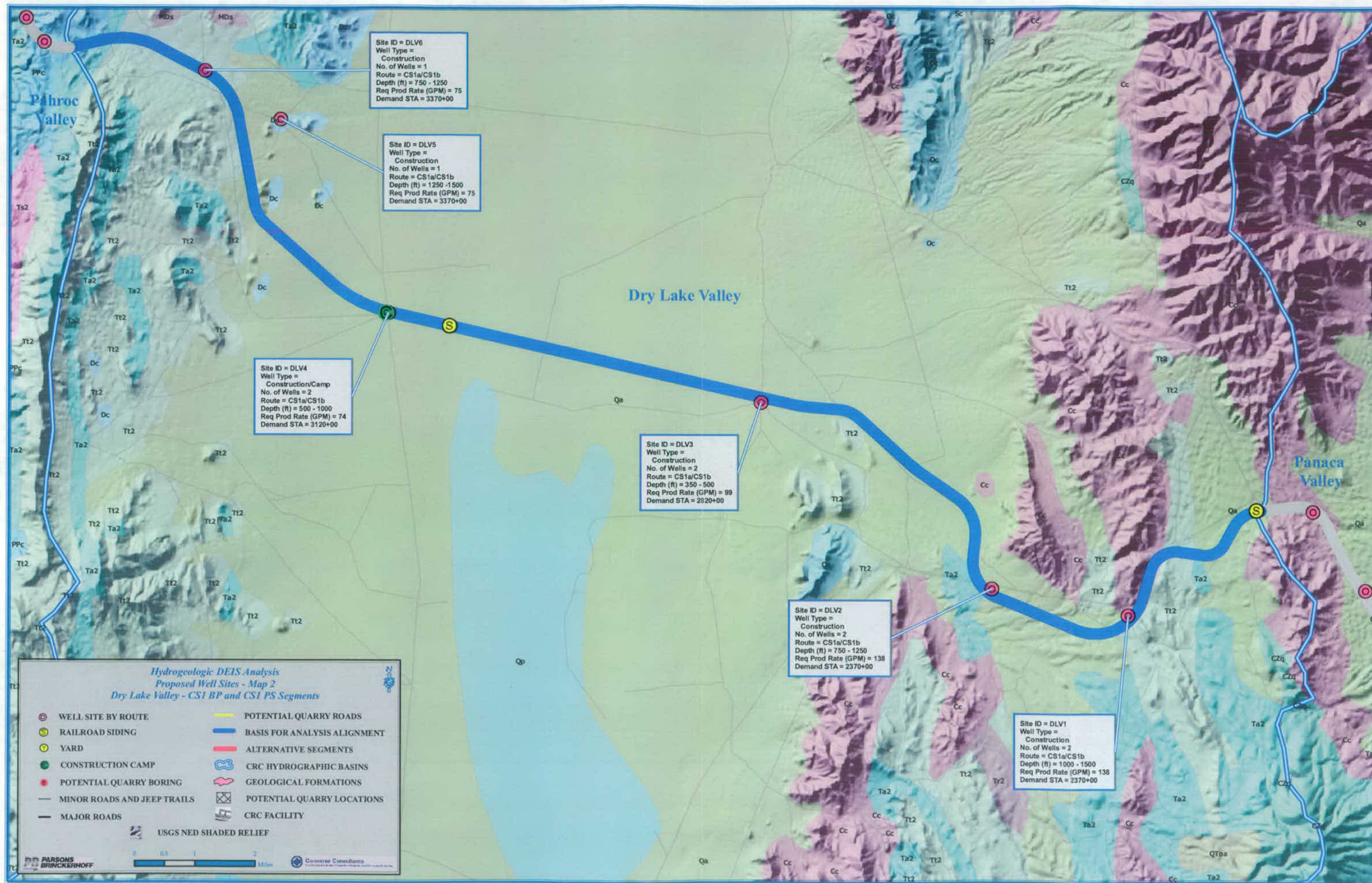
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152	Ta2	ANDESITE AND RELATED ROCKS OF INTERMEDIATE COMPOSITION
164	Ta3	ANDESITE AND RELATED ROCKS OF INTERMEDIATE COMPOSITION
107	Tb	BASALT FLOWS
173	Tba	ANDESITE AND BASALT FLOWS
106	Tbg	BANBURY FORMATION
167	Tbr	Breccia
11	Tgr	GRANITIC ROCKS
137	Ths	HORSE SPRING FORMATION
188	Ti	INTRUSIVE ROCKS
157	TJgr	GRANITIC ROCKS, CENTRAL AND EASTERN NEVADA
140	TKs	CONTINENTAL SEDIMENTARY ROCKS
100	TKsu	CONTINENTAL SEDIMENTARY ROCKS
5	Tmi	INTRUSIVE ROCKS OF MAFIC AND INTERMEDIATE COMPOSITION
133	Tob	OLDER BASALT ROCKS
161	Tr1	RHYOLITIC FLOWS AND SHALLOW INTRUSIVE ROCKS
174	Tr2	RHYOLITIC FLOWS AND SHALLOW INTRUSIVE ROCKS
182	Tr3	RHYOLITIC FLOWS AND SHALLOW INTRUSIVE ROCKS
78	TRc	LIMESTONE, MINOR AMOUNTS OF DOLOMITE, SHALE, SANDSTONE, THICK CONGLOMERATE
79	TRch	CHINLE FORMATION AND ASSOCIATED ROCKS (UPPER TRIASSIC)
241	TRgr	GRANITIC ROCKS
192	Tri	RHYOLITIC INTRUSIVE ROCKS
87	Trk	KOIPATO GROUP AND RELATED ROCKS (LOWER TRIASSIC)
92	TRlgr	LEUCOGRANITE AND RHYOLITE PORPHYRY
250	TRmt	MOENKOPI FORMATION, THAYNES FORMATION, AND RELATED ROCKS (LOWER TRIASSIC)
232	TRPD	CONGLOMERATE, SANDSTONE, SHALE, DOLOMITE OF DIABLO FORMATION, CANDELARIA
110	TRPs	SILTY LIMESTONE, MINOR AMOUNTS OF SHALE, SOME GREENSTONE
80	TRPvs	VOLCANIC FLOWS, FLOW BRECCIAS OF ANDES. COMPOSITION, TUFF, SPARSE SANDSTONE
200	Trt	ASH-FLOW TUFFS, RHYOLITIC FLOWS, AND SHALLOW INTRUSIVE ROCKS
127	Ts1	SEDIMENTARY ROCKS
146	Ts2	TUFFACEOUS SEDIMENTARY ROCKS
139	Ts3	TUFFACEOUS SEDIMENTARY ROCKS
189	Tt1	WELDED AND NON-WELDED SILICIC ASH-FLOW TUFFS
171	Tt2	WELDED AND NON-WELDED SILICIC ASH-FLOW TUFFS
187	Tt3	WELDED AND NON-WELDED SILICIC ASH-FLOW TUFFS
154	Tts	ASH-FLOW TUFFS AND TUFFACEOUS SEDIMENTARY ROCKS
3	Xm	METAMORPHIC ROCKS
136	Ygr	GRANITIC ROCKS
115	Zqs	QUARTZITE, PHYLLITIC SILTSTONE, CONGLOMERATE, LIMESTONE, DOLOMITE
113	Zw	WYMAN FORMATION

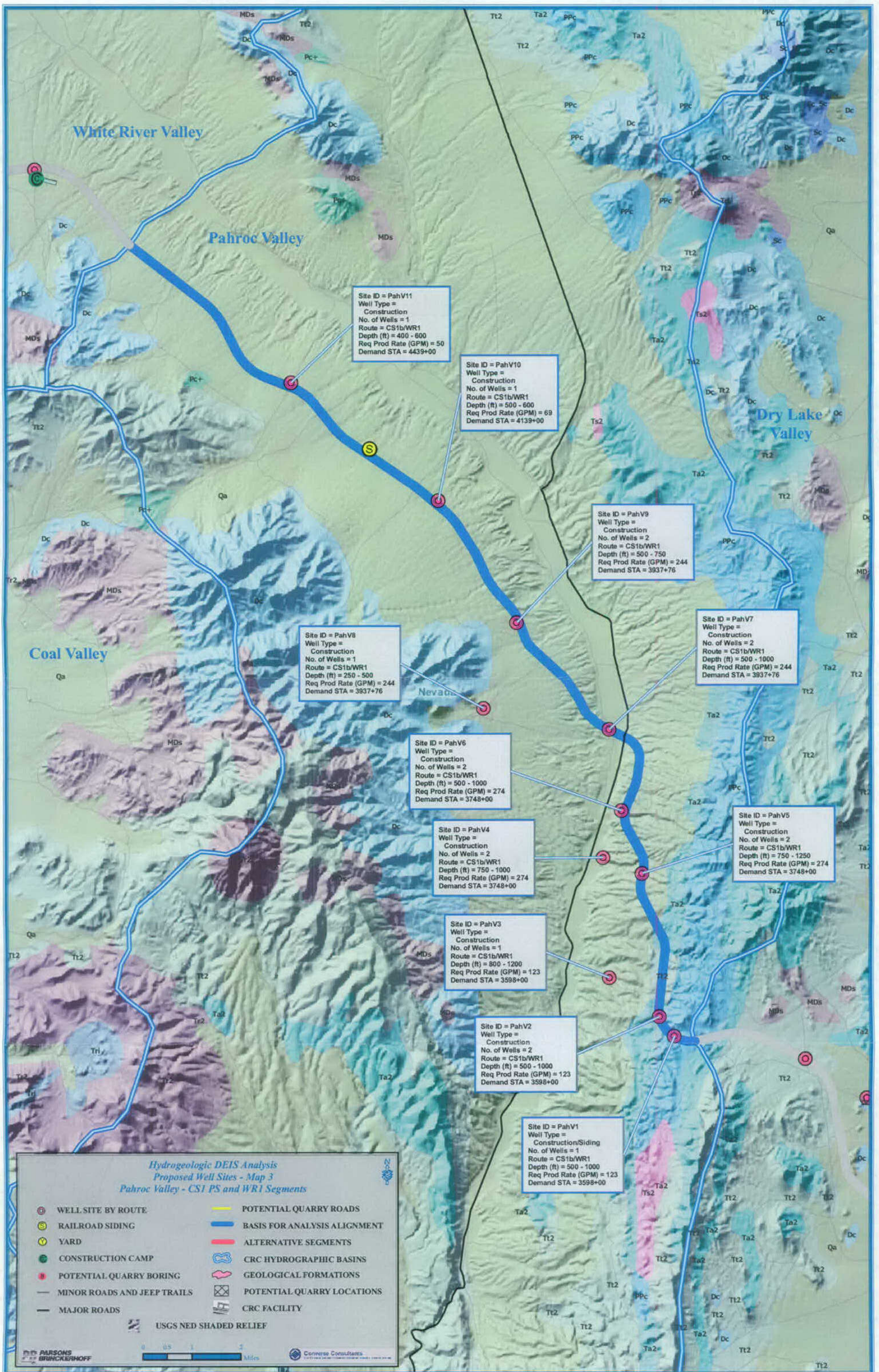
* Source: J.H. Stewart and J.E. Carlson, 1978

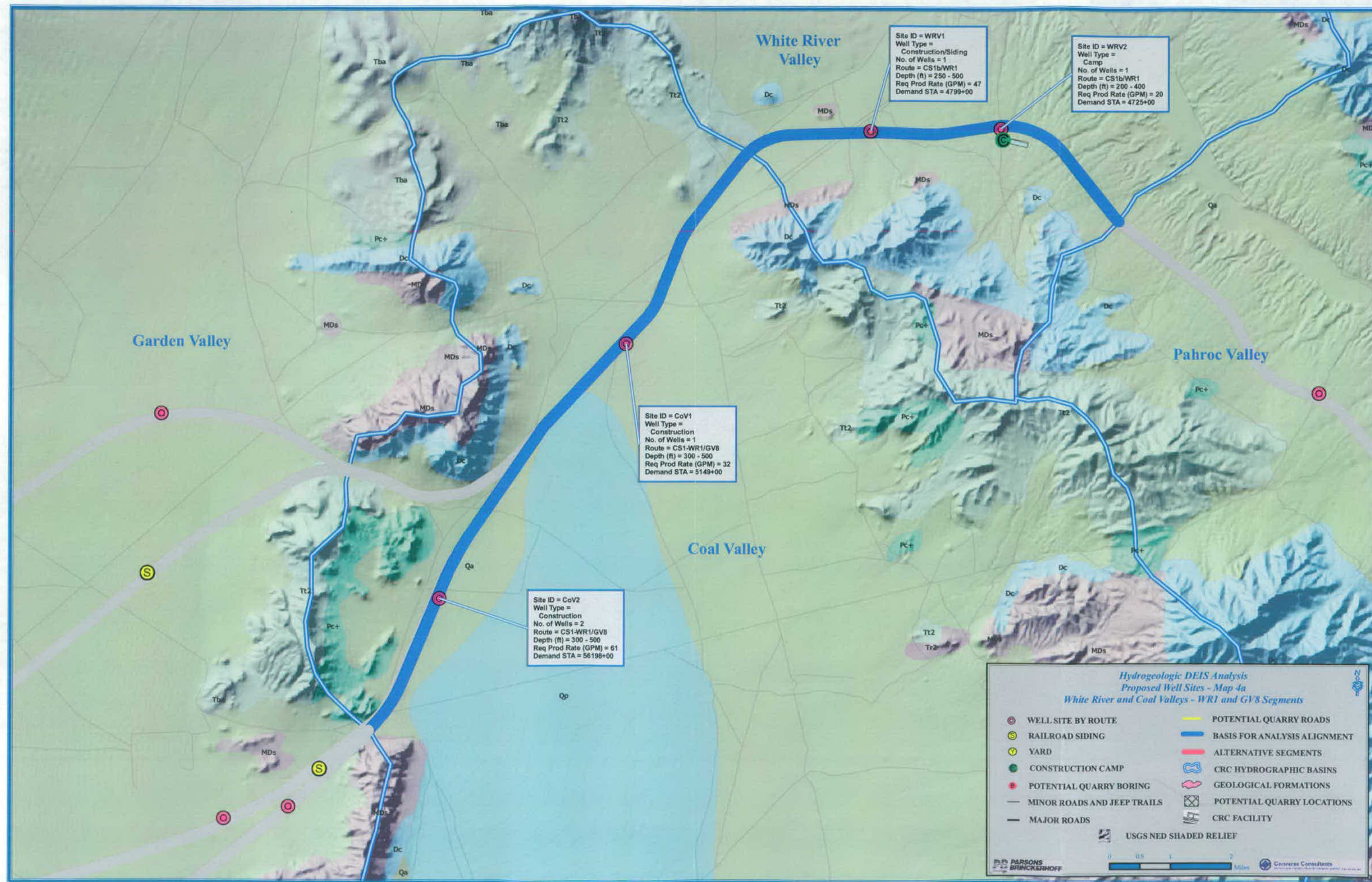


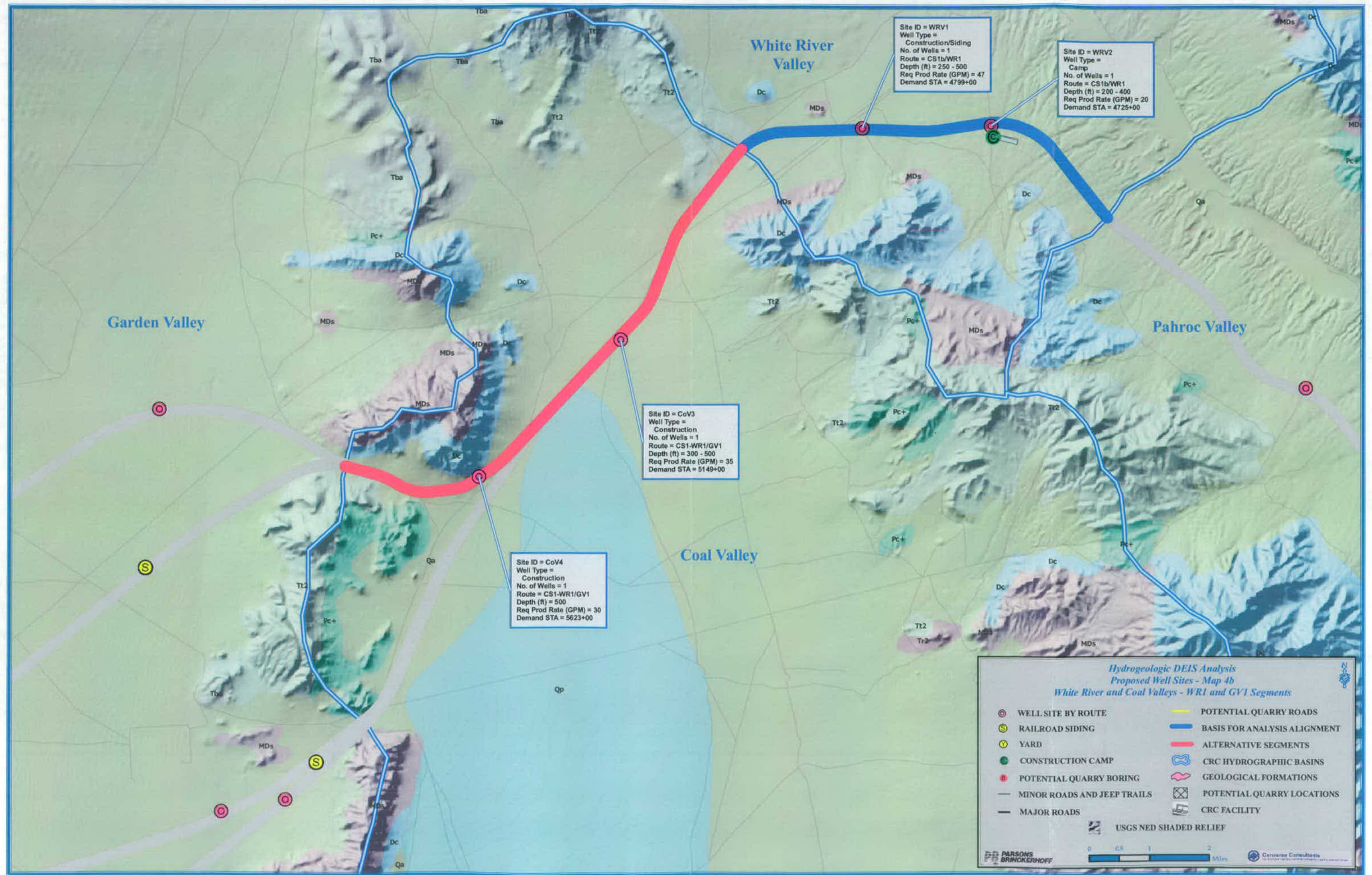


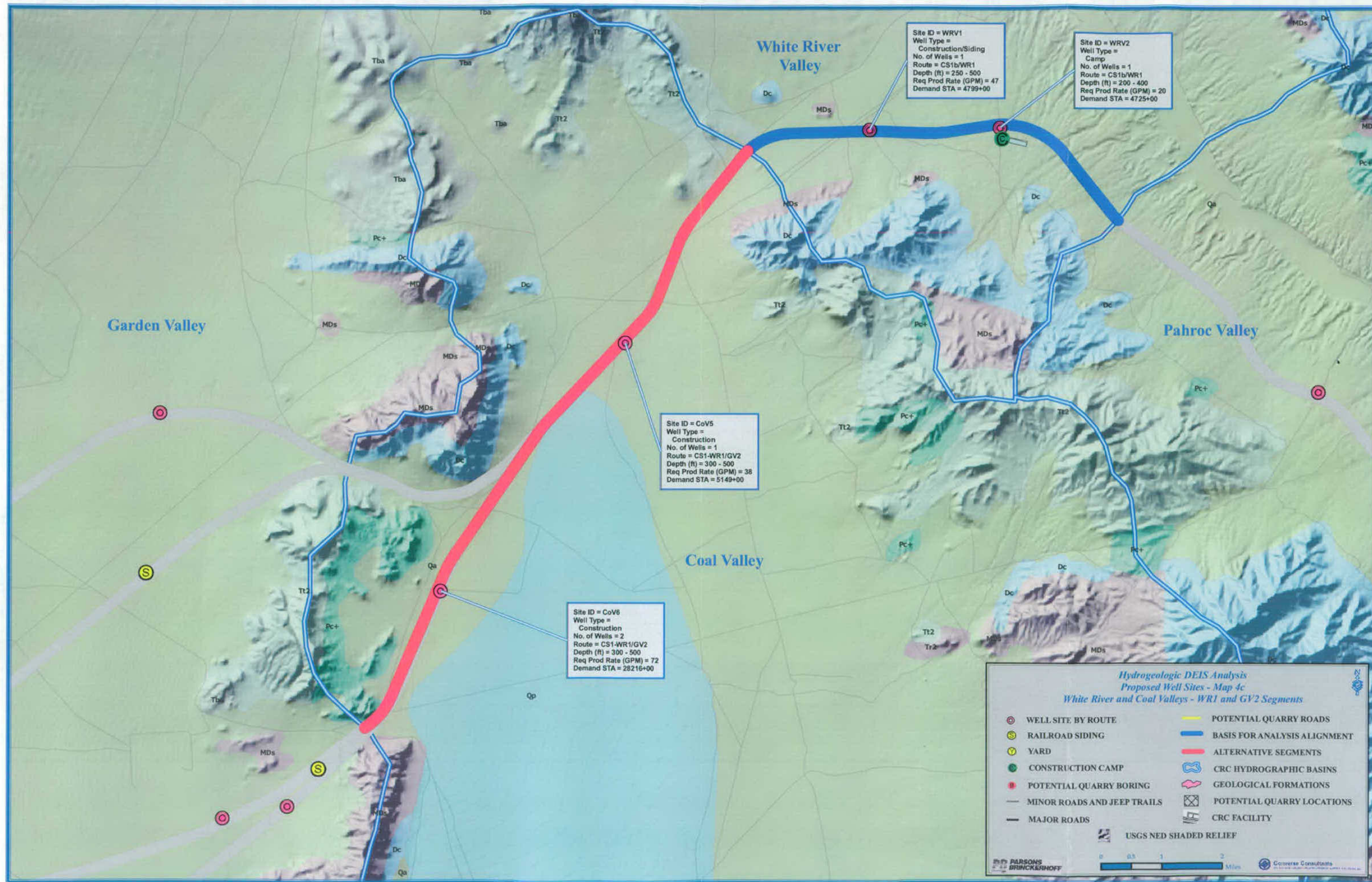




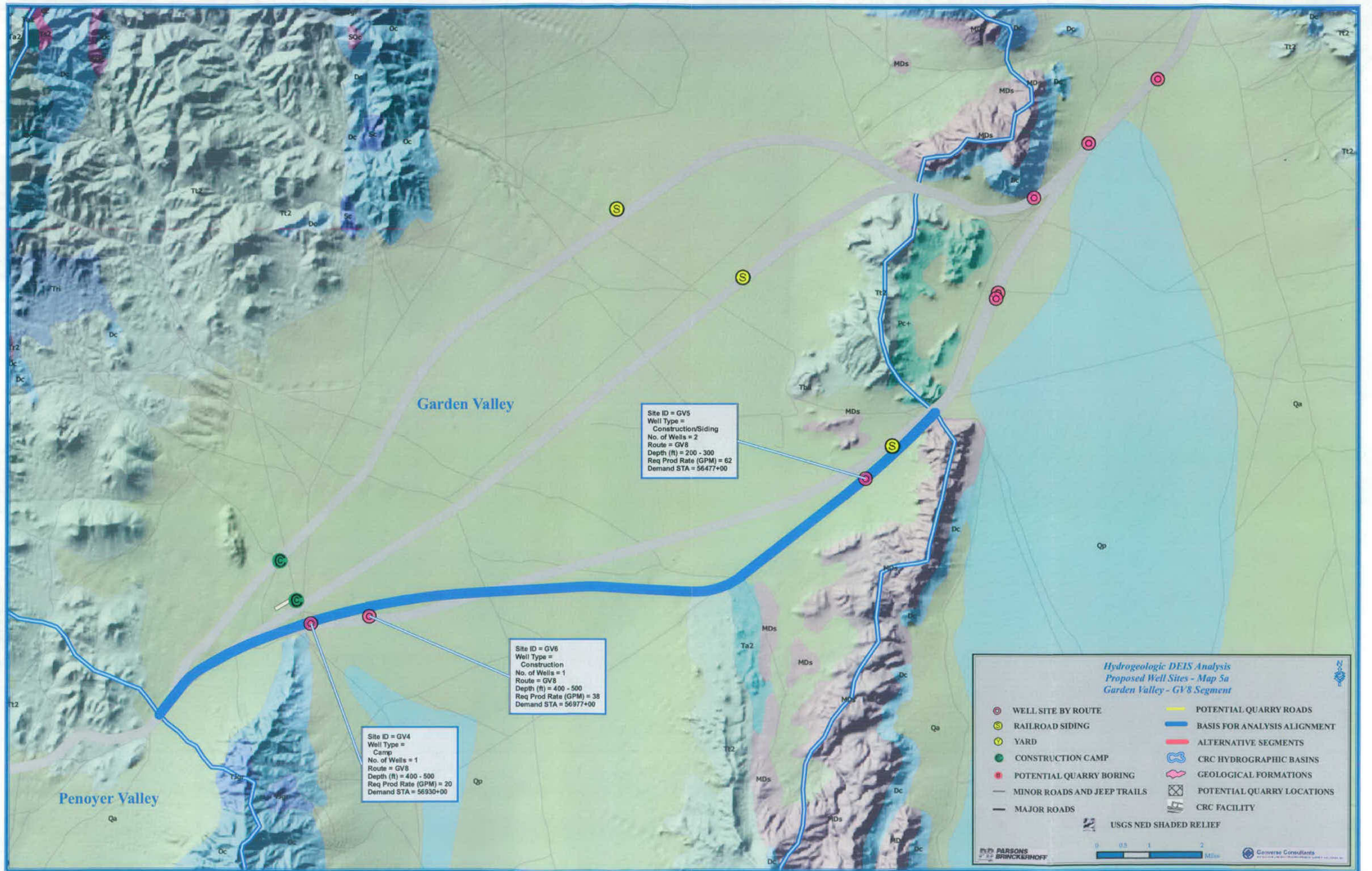












Garden Valley

Penoyer Valley

Site ID = GV5
Well Type =
Construction/Siding
No. of Wells = 2
Route = GV8
Depth (ft) = 200 - 300
Req Prod Rate (GPM) = 62
Demand STA = 56477+00

Site ID = GV6
Well Type =
Construction
No. of Wells = 1
Route = GV8
Depth (ft) = 400 - 500
Req Prod Rate (GPM) = 38
Demand STA = 56977+00

Site ID = GV4
Well Type =
Camp
No. of Wells = 1
Route = GV8
Depth (ft) = 400 - 500
Req Prod Rate (GPM) = 20
Demand STA = 56930+00

Hydrogeologic DEIS Analysis
Proposed Well Sites - Map 5a
Garden Valley - GV8 Segment

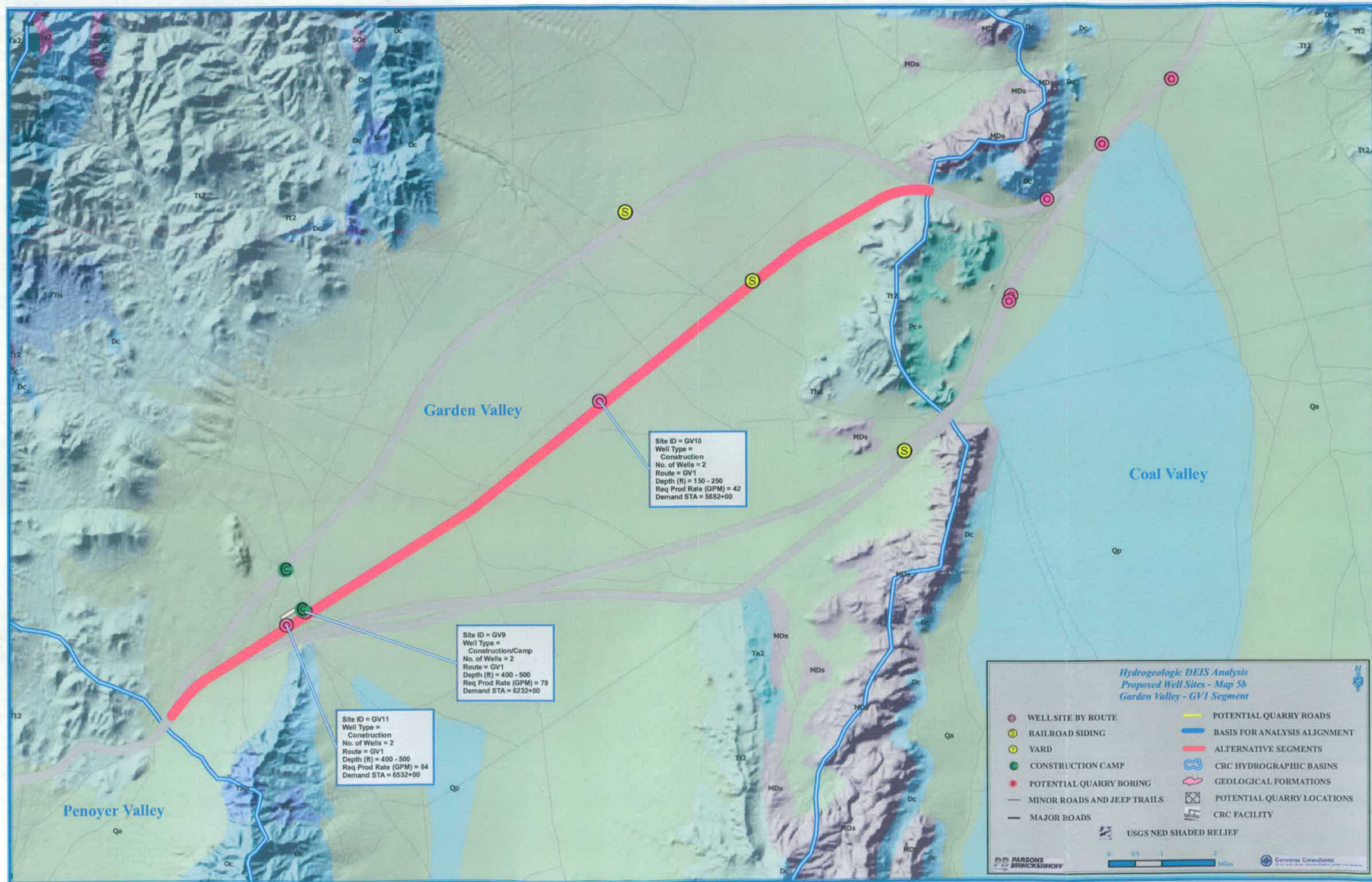
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|-------------------------------|--------------------------------|
| ⊙ WELL SITE BY ROUTE | — POTENTIAL QUARRY ROADS |
| ⊙ RAILROAD SIDING | — BASIS FOR ANALYSIS ALIGNMENT |
| ⊙ YARD | — ALTERNATIVE SEGMENTS |
| ⊙ CONSTRUCTION CAMP | ⊙ CRC HYDROGRAPHIC BASINS |
| ⊙ POTENTIAL QUARRY BORING | ⊙ GEOLOGICAL FORMATIONS |
| — MINOR ROADS AND JEEP TRAILS | ⊙ POTENTIAL QUARRY LOCATIONS |
| — MAJOR ROADS | ⊙ CRC FACILITY |

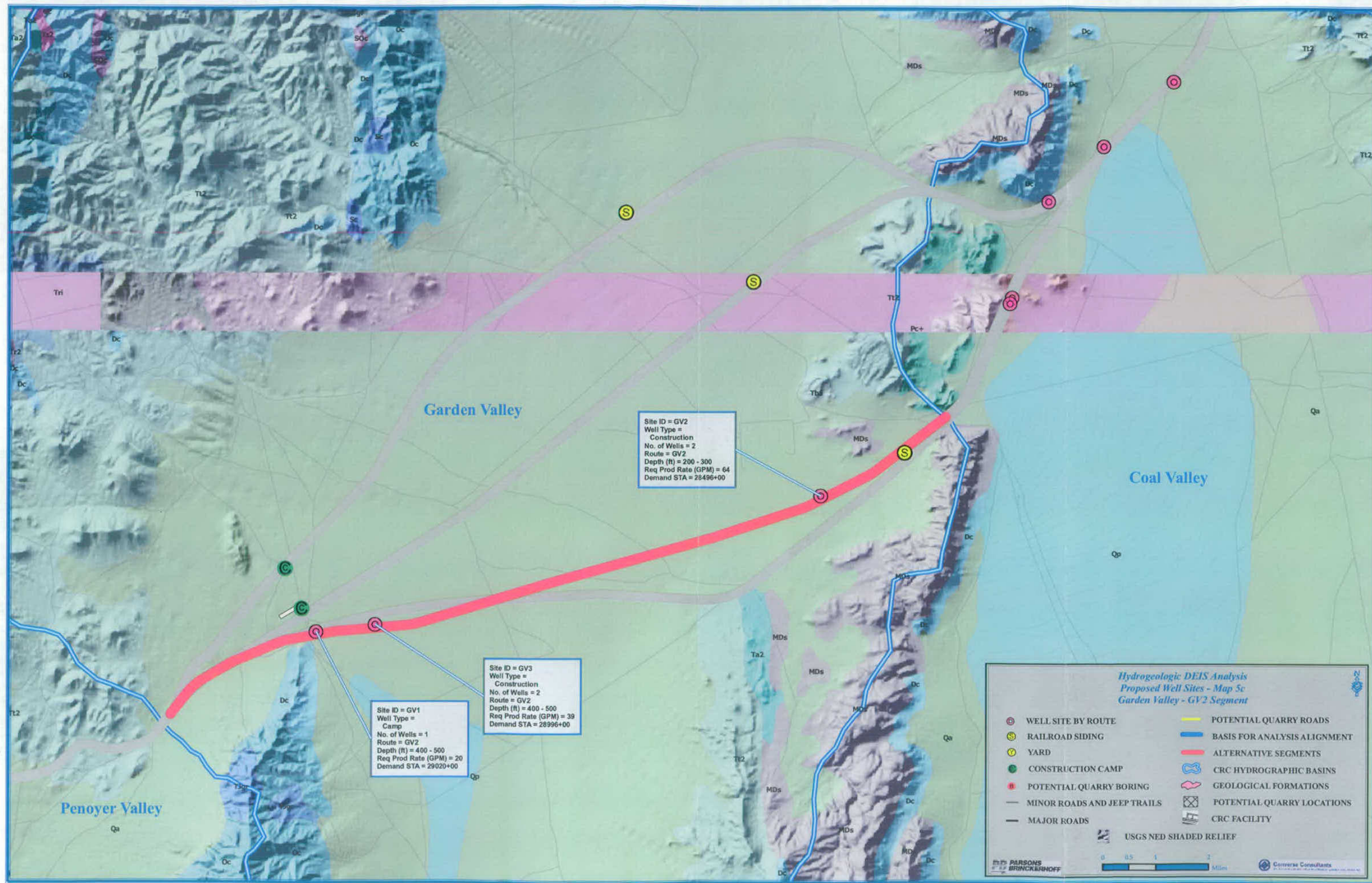
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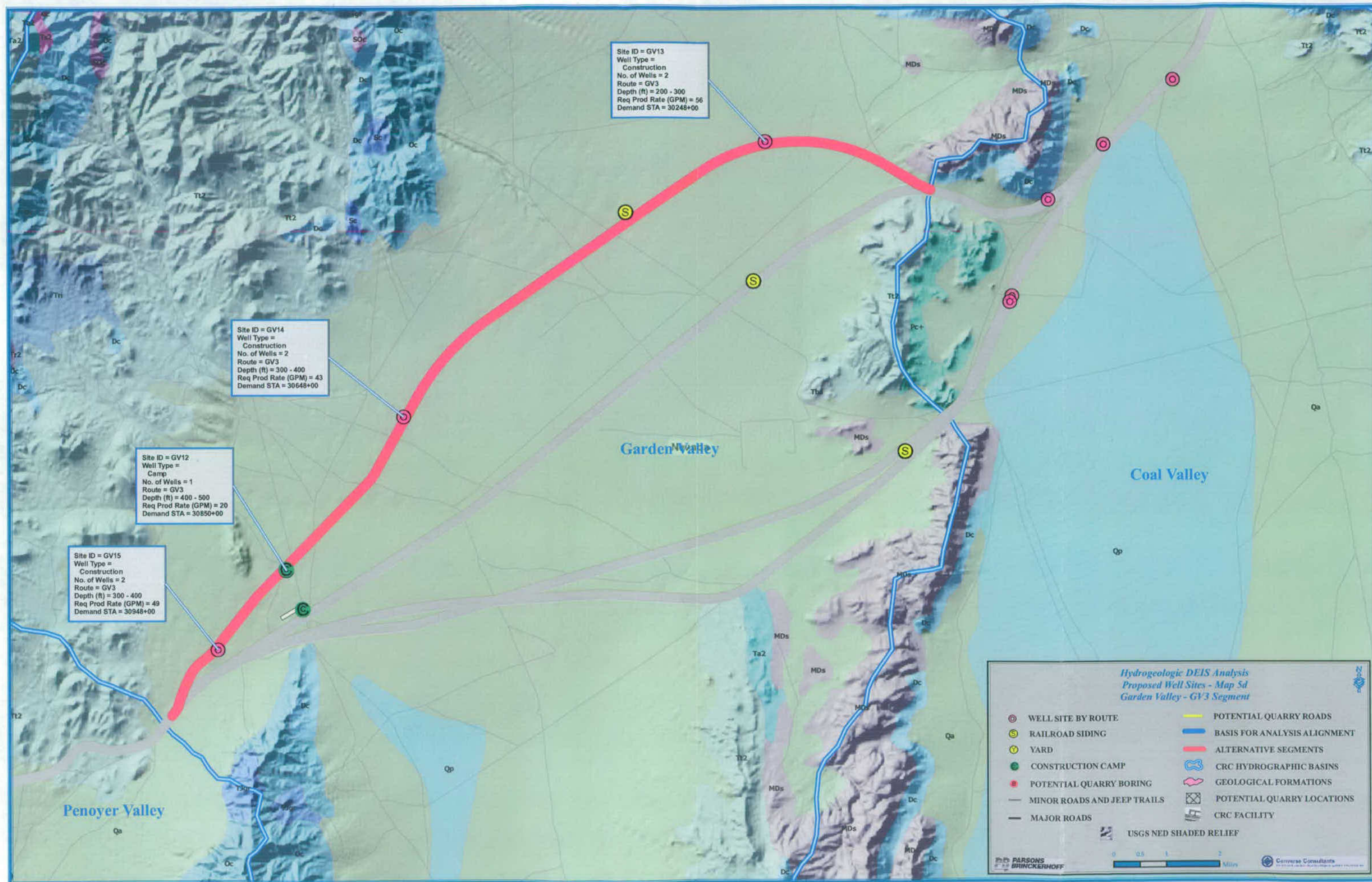
PARSONS
BRINCKERHOFF

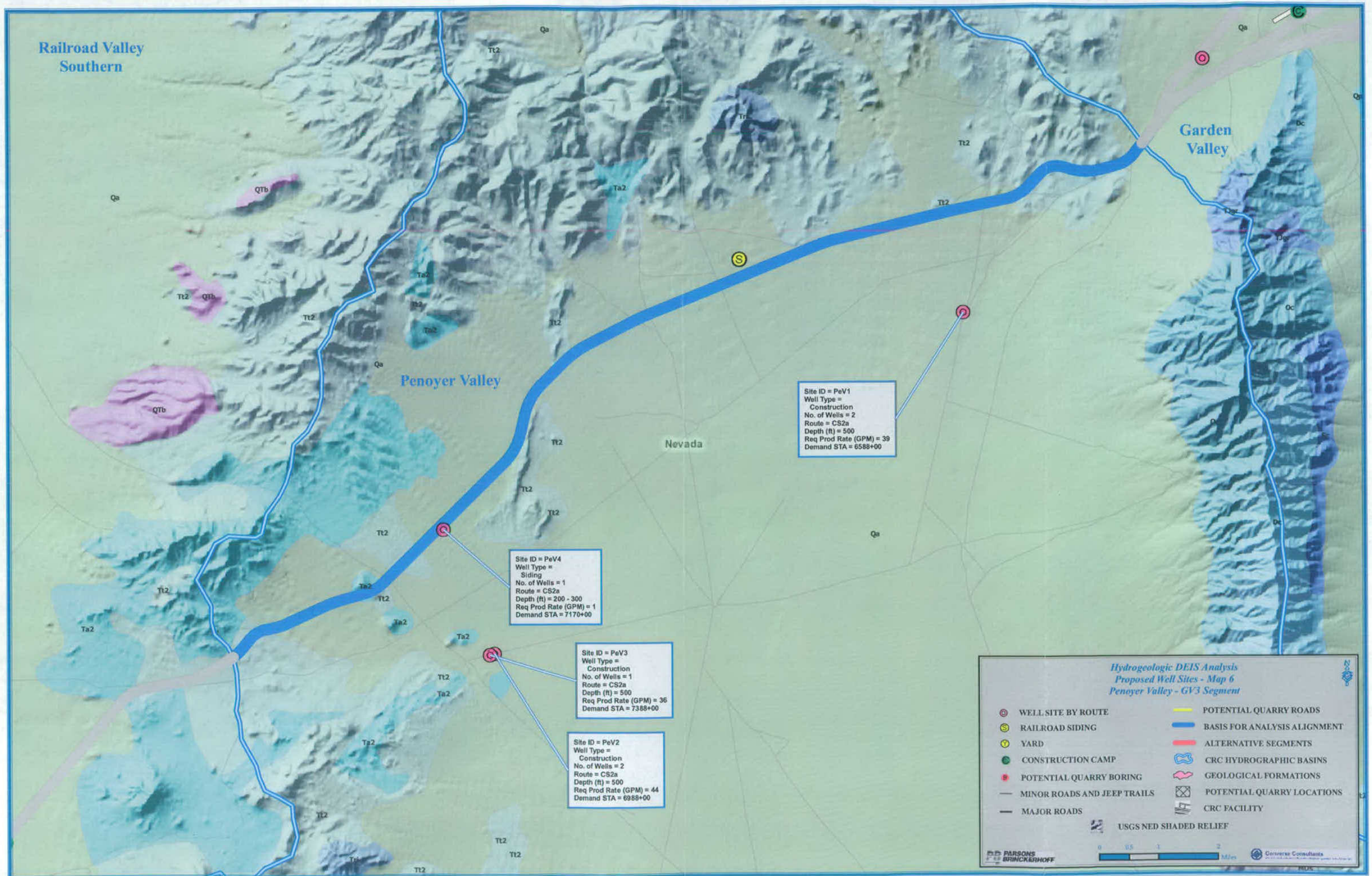


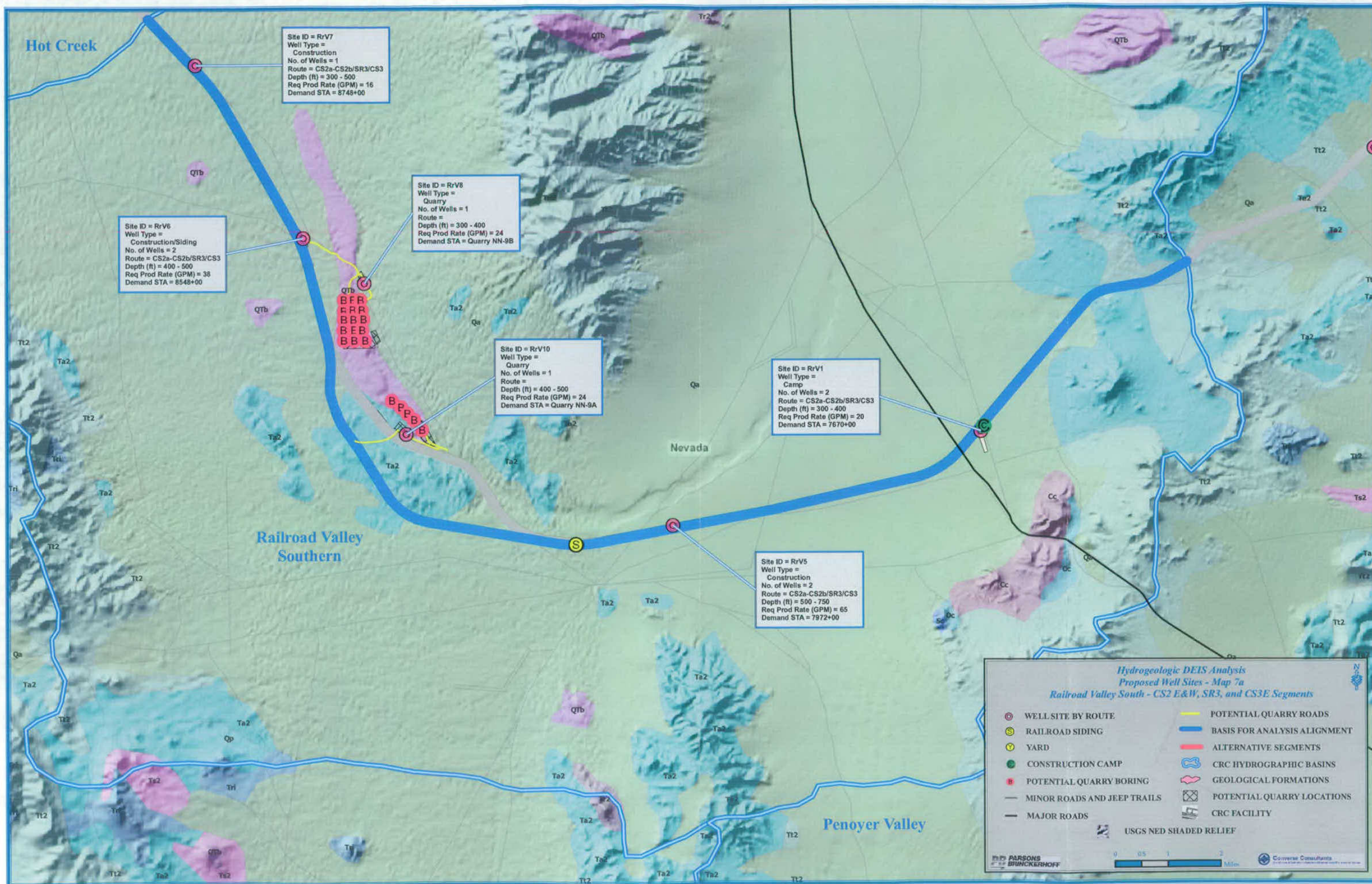
Converse Consultants

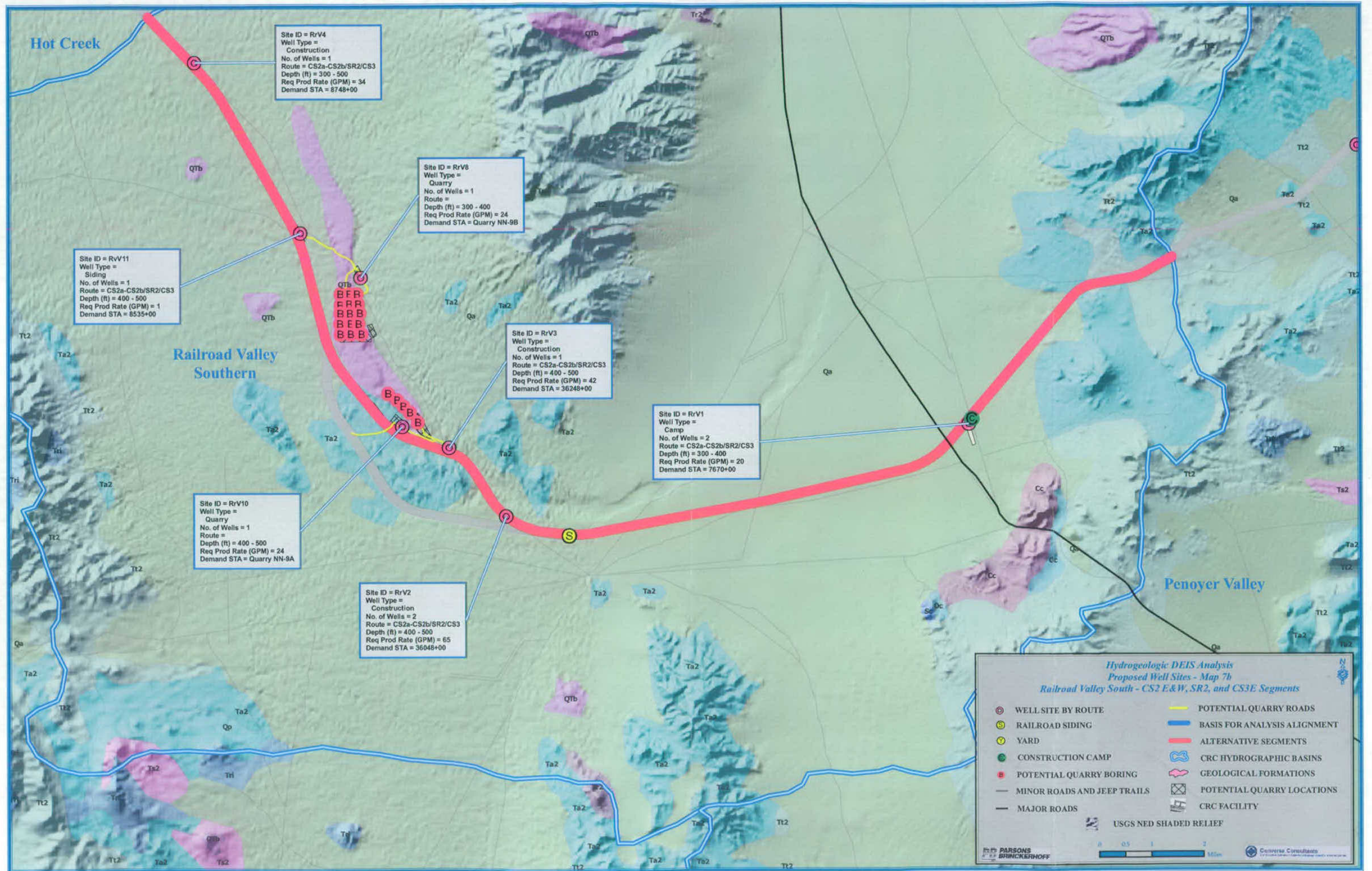


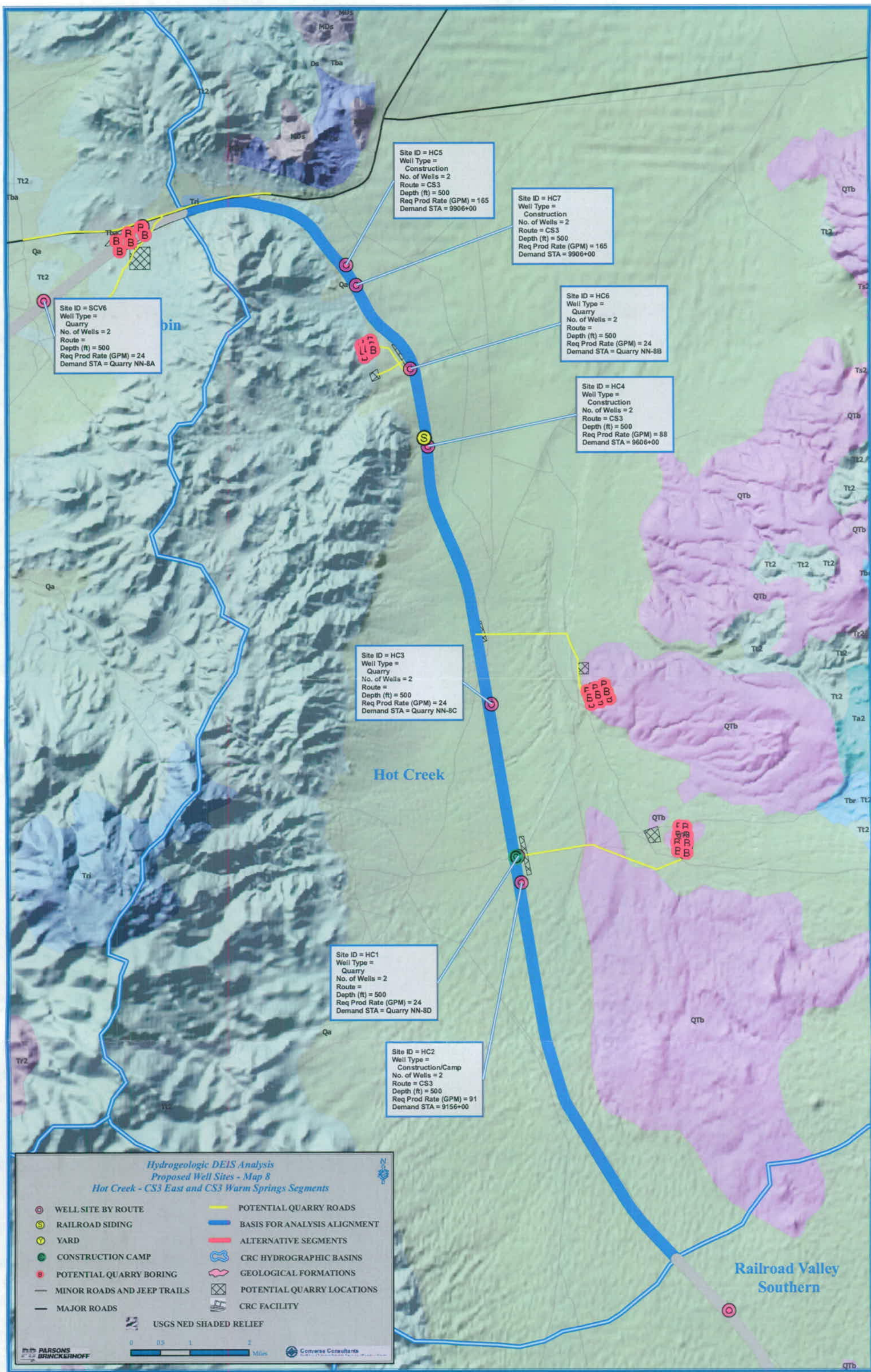


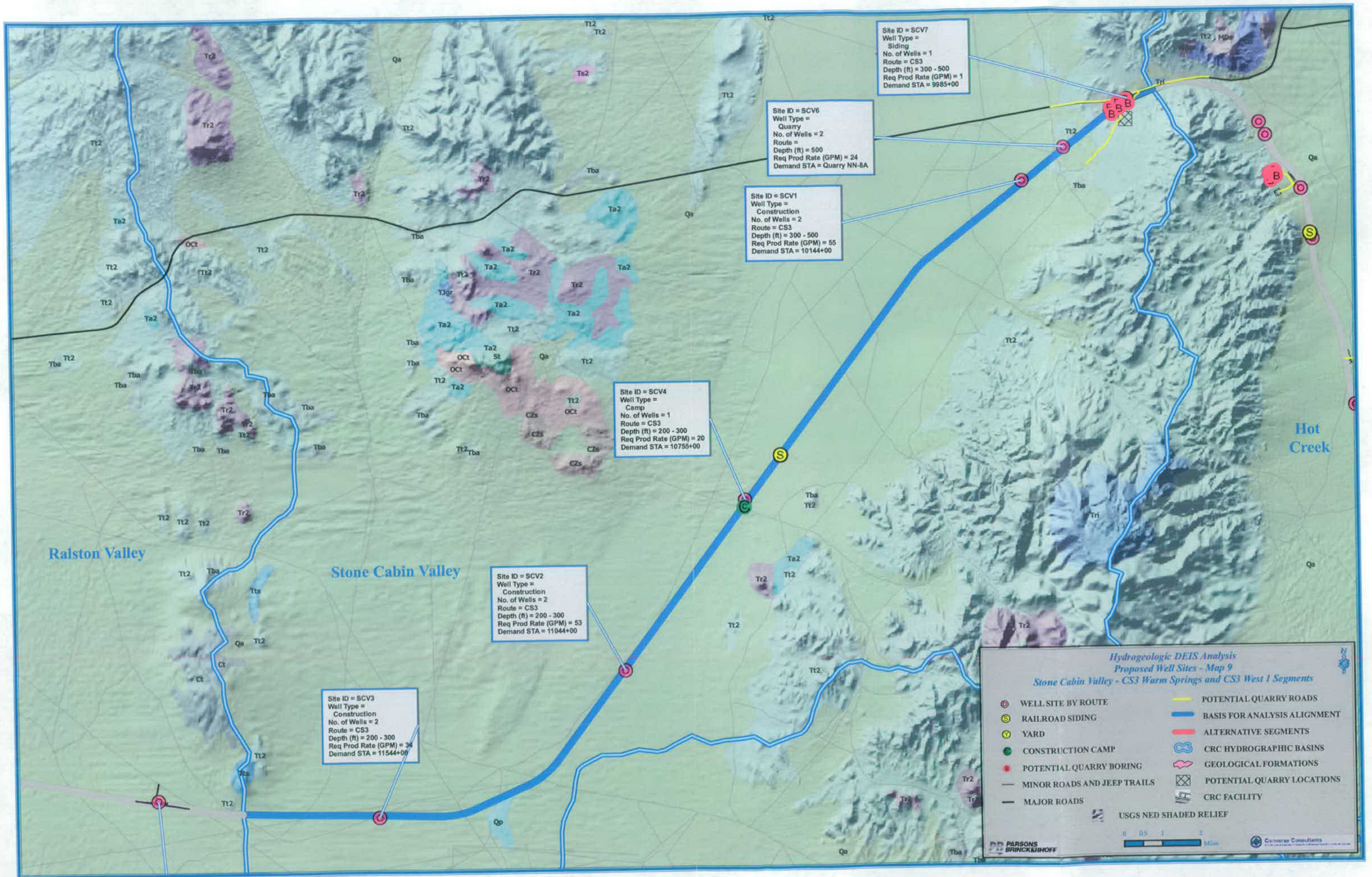


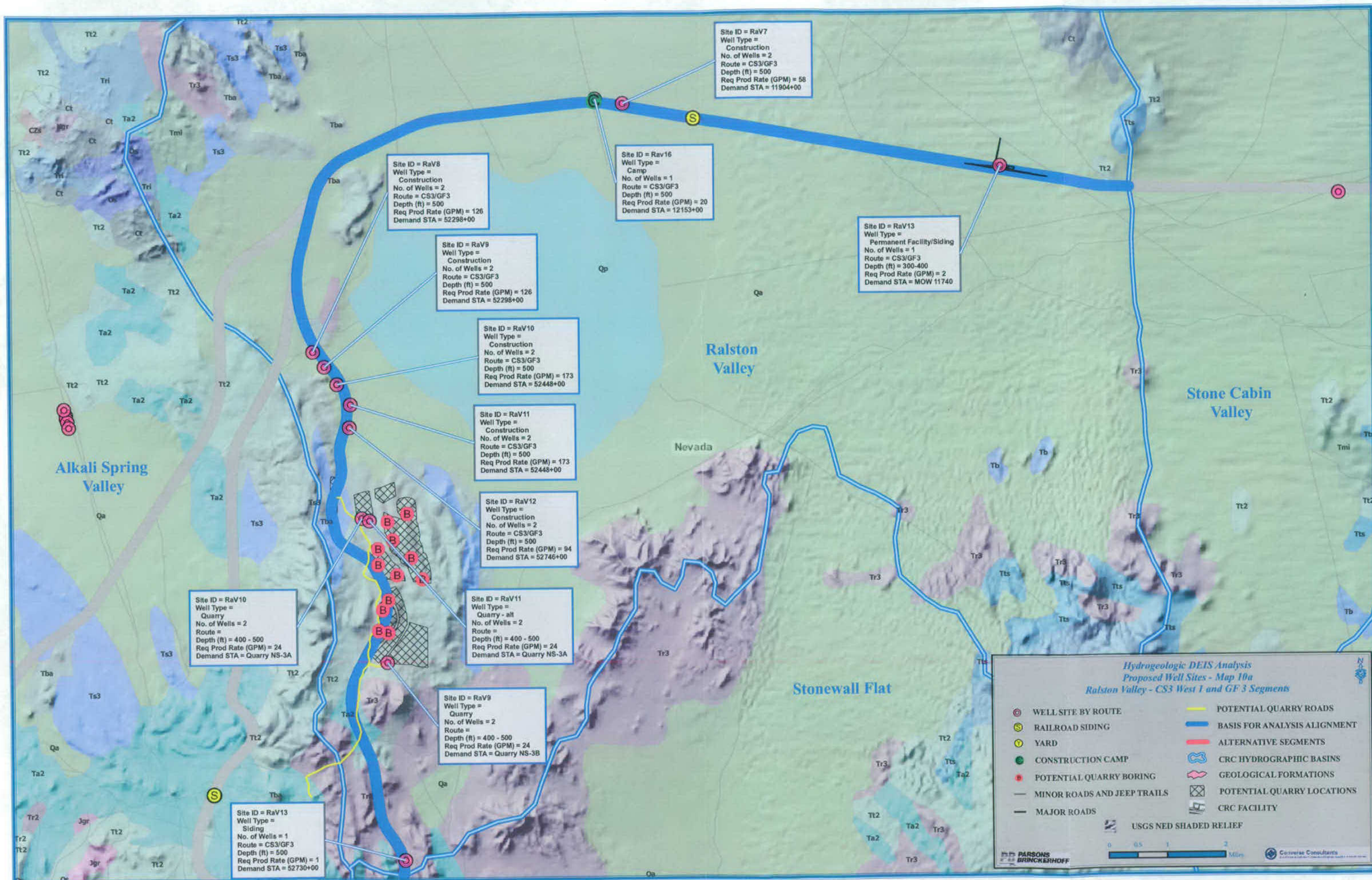


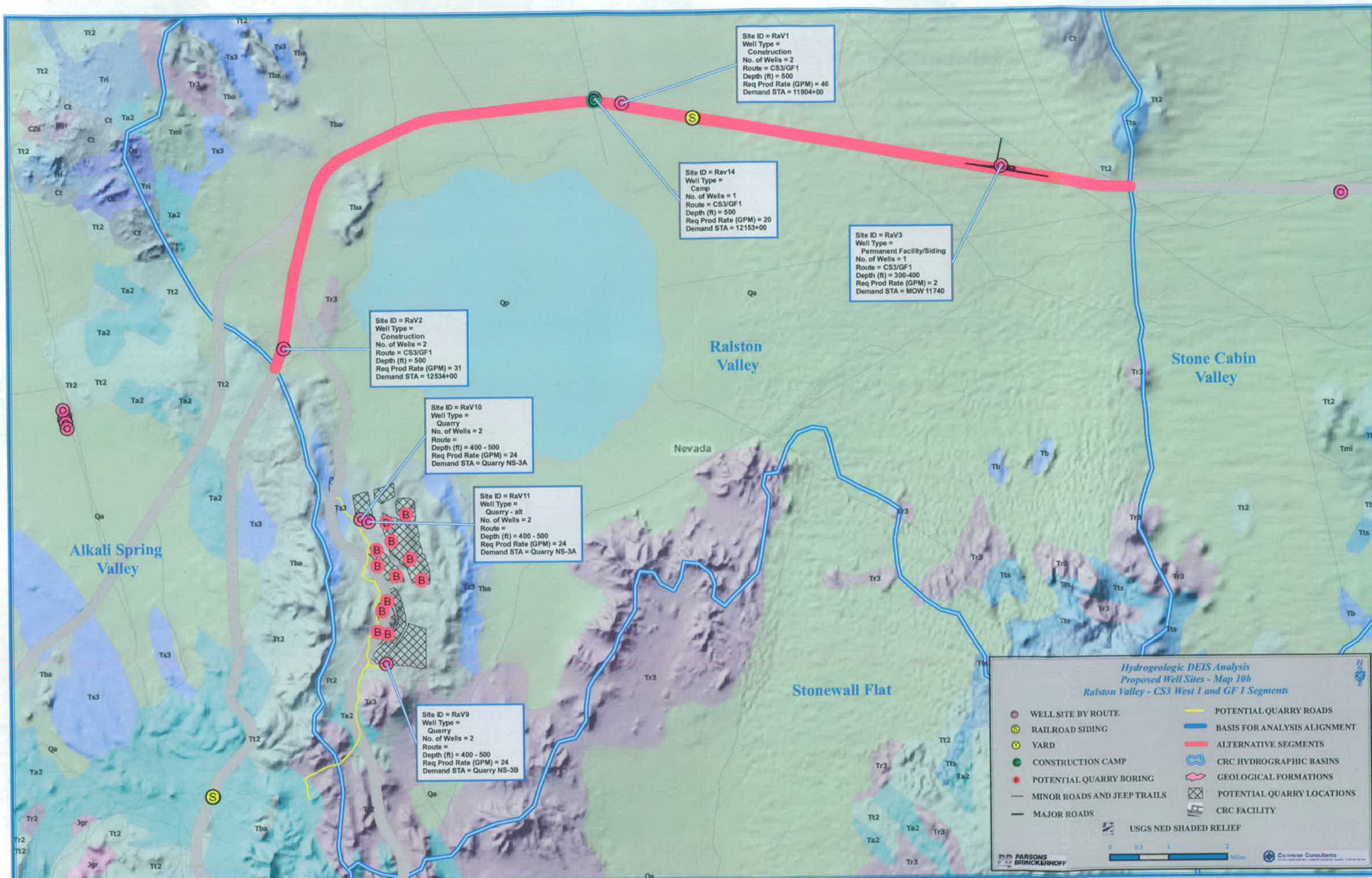


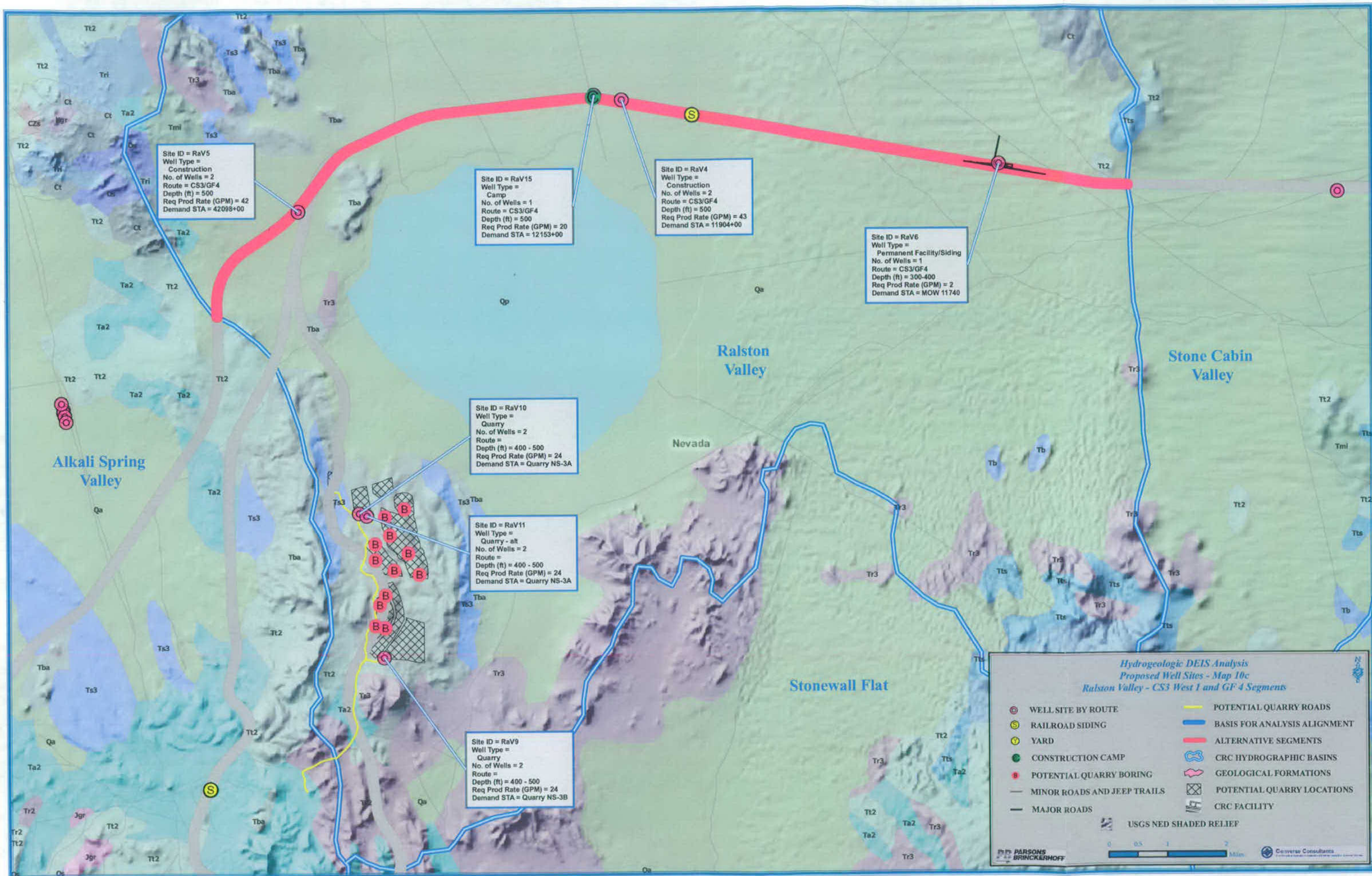












Hydrogeologic DEIS Analysis
Proposed Well Sites - Map 11a
Alkali Spring Valley - GF 1 Segment

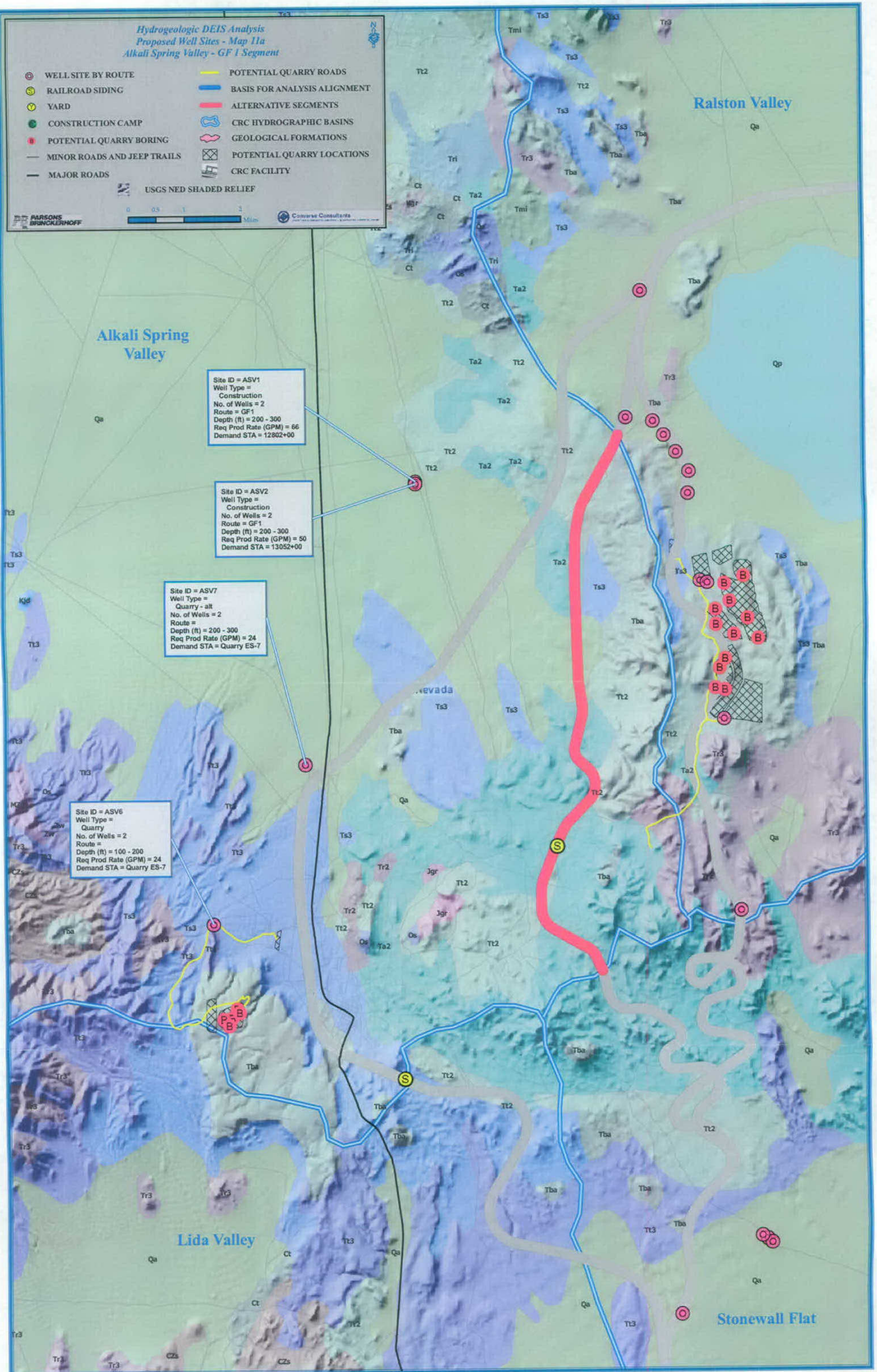
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|-----------------------------|------------------------------|
| WELL SITE BY ROUTE | POTENTIAL QUARRY ROADS |
| RAILROAD SIDING | BASIS FOR ANALYSIS ALIGNMENT |
| YARD | ALTERNATIVE SEGMENTS |
| CONSTRUCTION CAMP | CRC HYDROGRAPHIC BASINS |
| POTENTIAL QUARRY BORING | GEOLOGICAL FORMATIONS |
| MINOR ROADS AND JEEP TRAILS | POTENTIAL QUARRY LOCATIONS |
| MAJOR ROADS | CRC FACILITY |

USGS NED SHADED RELIEF

PARSONS
BRINCKERHOFF

0 0.5 1 2 Miles

Corvair Consultants



Hydrogeologic DEIS Analysis
Proposed Well Sites - Map 11b
Alkali Spring Valley - GF 4 Segment

- WELL SITE BY ROUTE
- RAILROAD SIDING
- YARD
- CONSTRUCTION CAMP
- POTENTIAL QUARRY BORING
- MINOR ROADS AND JEEP TRAILS
- MAJOR ROADS
- POTENTIAL QUARRY ROADS
- BASIS FOR ANALYSIS ALIGNMENT
- ALTERNATIVE SEGMENTS
- CRC HYDROGRAPHIC BASINS
- GEOLOGICAL FORMATIONS
- POTENTIAL QUARRY LOCATIONS
- CRC FACILITY

USGS NED SHADED RELIEF

PARSONS
BRINCKERHOFF

0 0.5 1 2 Miles

Converse Consultants

